AVIATION

The Oldest American Aeronautical Magazine

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Flight picture of "Italia" commanded by Gen. Umberto Nobile

VOLUME XXIV

NUMBER 22

Special Features

The Stinson "Junior"
The Detroit Air-Olympics
The Szekely SR-3 Air Cooled Engine

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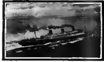

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AVIATION

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Vol. XXIV MAY 26, 1928 No. 22

Give Them Service

IF PLANS and preparations now under way are carried out according to schedule, there should be at least five thousand airports in operation by the end of this year. Just what the equipment provided by these airports will be is a matter for speculation, but it is sincerely hoped that each will at least provide suitable facilities for the servicing of airplanes.

The problem of service is one which is becoming more and more important as each new plane takes the air. Up to the time of Lindbergh's great flight there were not enough planes in operation to cause the manufacturer to consider that phase. But now that production is being doubled and trebled it is different. The plane owner not only wants service but demands it and the manufacturer who does not immediately take steps to render service to his customers will be bit by his own boomerang.

The rendering of service to car owners has proved to be one of the best sales arguments in the automobile industry. There is no reason to believe it is not so in the aeronautical industry. Heretofore the plane manufacturer has had only a product to sell but now he has service to sell also. He has got to consider the question of establishing authorized service stations throughout the country if he intends to keep his customers, and incidentally get new ones.

A satisfied customer is not only a prospect for next year's model, but he is also a splendid advertising medium. However, if he is not able to obtain service he will not be satisfied for very long and the subsequent loss to the manufacturer will be double.

Rescuing the Bremen

ONE OF the outstanding features of the East to West crossing of the North Atlantic that has characterized it from all other successful crossings is the total disregard for the welfare of the plane by those who piloted it to its present resting place. When Lindbergh landed in Paris his first concern was for his plane and as soon as he had obtained sufficient rest from his ordeal he went to Le Bourget Field and cared for his plane. And when Chamberlin damaged the "Columbia" on the second landing in Germany he stayed right with his plane until it was repaired and ready for additional flights.

However with the case of the "Bremen" it was a different story. When it was found impossible to remove it from Greenely Island the crew left it there and came out to civilization in another plane. That visit was most certainly justified in view of the fact that the world in general desired to bestow its praise upon the gallant crew for their great accomplishment. But instead of going back for their plane at the earliest opportunity they started off on a country wide tour and left the task of removing the Bremen from Greenely Island to the U. S. Government.

Just how the Government's aid was solicited is not quite clear and it does not matter. But it is rather surprising that the head of the U S Army Air Corps should take charge of what is nothing less than a rescue crew. Of course it is realized that the Chief of the Army Air Corps is the type of man who does not spend all his time in his office, and gets out and really flies. And it is also realized that he would be the first to render aid to another airman. However his position is one of great responsibility and his participation in such a venture does not seem necessary. Undoubtedly he is carrying out the orders of his superiors, and if so then they are to be criticized for their line of action. To lend assistance in getting the Bremen out of Greenely Island is a worthy undertaking for the U S Air Corps, yet at the same time it is a bit mystifying that the Bremen's crew should carry on touring the country and leave it to the officer of rank in the Air Corps to head the rescue expedition.

The Twentieth Anniversary

THE EIGHTH day of next month will be one of celebration in English aeronautical circles for it marks the twentieth anniversary of the first airplane flight over British soil. The pilot on that memorable aerial venture was A. V. Roe and the plane was a triplane of his own construction fitted with a 24 hp Antoinette engine. Like the late Wilbur Wright's famous flight at Kitty Hawk, Mr Roe's flight at Brooklands was not long in duration as he only covered a distance of sixty yards at the height of but a few feet. Nevertheless it was the beginning of successful heavier than-air development in England.

Mr Roe is still actively engaged in that work of development and his Avro planes are well known throughout the entire aeronautical world. AVIATION takes this opportunity to not only congratulate Mr Roe for his splendid accomplishment twenty years ago but also for his equally splendid accomplishments since that historic date.

The Szekely SR-3 Air Cooled Engine

New Three Cylinder Radial is Rated at 40 Hp. at 1800 R.P.M.

Front quarter view of the Szekely SR-3 40 hp air cooled engine

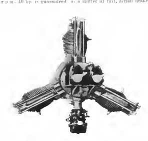
THE O. E. Szekely Corp. of Holland, Mich., has been consulting and industrial engineers to various manufacturers for a number of years and as a result of the experience gained in this work, it reached the conclusion about six months ago that there would be an ever increasing sale for simple, light weight, reliable, air cooled aircraft engines embodying many of the exclusive features which have worked out so well on equipment it has designed for others.

Accordingly it undertook the design of a three cylinder radial, air cooled engine for light aircraft, to be followed in the near future by a five cylinder, using practically all of the parts of the three cylinder engine.

The extremely simple outward appearance of the three cylinder design immediately commends it to approval, for the only visible moving parts are the push rods and rocker arms, all remaining parts being entirely enclosed. The engine has a 4⅛ in. bore by 4⅜ in. stroke, giving a total piston displacement of 190 cu. in. Operating at its rated speed of 1800 r.p.m. 40 hp. is guaranteed; as a matter of fact, actual brake tests are said to show that this engine develops over 42 hp. The compression ratio is 4.8 to 1.

The mounting flange for the engine consists of a round machined pilot fitted into the engine bracket on the plane. The engine is held in place by six tie rods, each of which passes entirely through the engine, so that the front cover, crankcase, rear cover, and mounting bracket are securely locked together.

The cylinders are chrome nickel gray iron, with cylinder head cast integral and are held to the crankcase by ten studs. Each cylinder has a skirt or piston guide extending approximately 2½ in. into the crankcase. Intake and exhaust passages are scraped and sand blasted and the entire cylinder is provided with numerous thin fins to provide ample radiation for the air cooling. Valve seats are part of the cylinder and are a 45 deg. angle. Two valves are used in each cylinder, these being silchrome steel, mushroom type, 45 deg. seat, providing a clear gas flow area of 2½ sq. in. The valves are 1 13/16 in. in diameter by 11/32 in. lift. The valves are actuated from the cam through hollow push rods with hardened ends and bronze bushed drop forged rockers. Tappet adjusting screw is placed in the rocker and locked in position, after adjustment, by a cap screw.



Rear view of the SR-3 fitted with two Scintilla magnetos and a Zenith carburetor. Robert Bosch magnetos are also used on the SR-3

The lubricating system is interesting. A double type gear pump is driven by a bronze spiral gear directly from the crankshaft. Four spur gears are used in the pump itself, the upper set receiving oil through a ⅜ in. line from an oil tank in the plane and delivering it under pressure to the connecting rod bearings and, by splash, to the main bearings, gears, and cylinder walls. Two other gears form the scavenging pump and are slightly larger than those of the delivery pump. This picks up the oil from the lower part of the case, to which surplus runs, and delivers it through a ⅜ in. line to the oil tank. An interesting innovation from usual practice is that the oil relief valve and the take off for oil gauge are placed at the rear of the engine so that oil pressure reading is taken after the oil has passed entirely through the engine. The pressure at the pump is approximately six times the reading given at the rear of the engine. This is said to

Left, the single piece, drop forged, heat treated crankshaft with SKF roller bearings. Center, the master connecting rod and connecting rod assembly. Right, showing the cam operation of the SR-3. Each cam is driven by an independent gear and operates two rockers.

be an additional safeguard, as it shows the flier that each part of the engine is receiving sufficient lubrication as long as oil pressure shows on the gauge. A gauge pressure of 4 lb. per sq. in. to 10 lb. per sq. in. is recommended, which means the pump pressure usually noted on other engines is 40 lb. per sq. in. to 60 lb. per sq. in.

The crankcase is of aluminum alloy, with front and rear covers of the same material. These covers hold the main bearings. The main crankshaft bearings are of the roller bearing type and located as close to the center of the crank pin as it is possible to get them, thus reducing chances for crankshaft whip and consequently reducing vibration to the minimum. The intake manifold is cast as an integral part of the crankcase in the form of a circular chamber with opening flange for carburetor at the bottom of the engine. Three outlets from this circular chamber are connected to the cylinder by an individual aluminum intake manifold, which fastens to each cylinder and is packed in such manner with gaskets at the crankcase that expansion and contraction may occur without putting a strain on any part of the engine and without permitting air leaks.

The crankshaft itself is 3140 S.A.E. material, having a diameter of 1 37/64 in. The connecting rod bearing on the crankshaft is 1 7/16 in. by 2 in. The crankshaft is a single piece drop forging, to which counterweights are added to insure perfect balance of the engine itself. The propeller thrust bearing is an S.K.F. bearing of the deep groove, radial ball bearing type and is taken directly between the front of the crankshaft and the front gear cover of the engine itself. The propeller hub is steel and heat treated for maximum strength. Each propeller hub is lapped to the crankshaft of its own engine, in addition to the precision operation of grinding both the hub and the crankshaft.

Connecting rod assemblies are drop forgings heat treated for toughness and machined all-over. The upper end of the connecting rod is bronze bushed. The lower bearings are sections of a cylinder cut on an angle with the axis of the bearing and contact with a bronze bearing the internal portion of which is babbitt lined and free to revolve around the crank pin. Oil pressure is delivered to the main connecting rod bearing and to each individual connecting rod bearing. This connecting rod assembly is said to provide greater insurance of complete lubrication and larger bearing surfaces in proportion to the load placed upon them than conventional practice of a master rod with round pin rods operating from it.

The pistons are of aluminum alloy, solid skirt type, each equipped with three ⅛ in. piston rings. The piston pin is hollow, hardened and ground and fastened to the aluminum piston at either end, but of the full floating type, in that it

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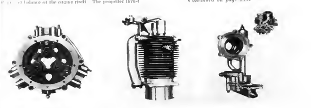


Left, view of the cast aluminum alloy crankcase with cam valve gear in place. Center, the cylinder assembly. Note the head is cast integral with the cylinder to eliminate any gasket troubles. Right, the oil pump and assembly. It is driven by spiral gears directly from the crankshaft.

The Stinson "Junior"

SM-2 is Almost Identical to the Detroiter Except that it is Smaller and is Powered with a 110 Hp. Warner Engine

ONE OF the first planes to get into production with the new Warner Scarab engine is the Stinson "Junior" or SM-2 cabin monoplane manufactured by the Stinson Aircraft Corp., Northville, Mich. The plane is almost identical to the standard Stinson Detroiter, except that it is somewhat smaller, being powered with a 110 hp. engine instead of the 220 hp Wright Whirlwind. The closed cabin seats four people under the wing, which fairs in with the top of the fuselage, increasing the head room. The wing is of semi-cantilever design supported by lift struts from the bottom of the fuselage. A new feature in the Stinson Junior, not found in other Stinson designs, is the wheel tail skid mounted on an oleo shock absorber leg. The first plane of this type was completed in three weeks, while the design work was completed in three weeks previous to that. William C Naylor, chief engineer of the Stinson Aircraft Corp., is the designer of the plane, which is intended to be a quality product for the sportsman, business man, or private owner.

The cabin of the SM-2 is quite wide, with four wicker chairs, properly upholstered, two in front and two behind. The necessary baggage can be stowed under these chairs. The inside of the cabin is trimmed with green leather to match the upholstery on the chairs. Two doors, one on each side of the fuselage and extending the full depth of the cabin, are provided for entrance or exit. Steps on the landing gear struts make these doors easily accessible. The windows of the cabin are fitted with shatter-proof glass. The front window can be raised or lowered by means of a bell crank, thus allowing the pilot good vision in freezing weather. The engine and engine mount are in such a position that the pilot can look directly over the engine with the tail wheel on the ground. A skylight of Pyralin, in the center section of the wing, gives proper vision above and to the rear.

The plane is fitted with dual side by side stick control, with two control sticks and two sets of rudder pedals. The ailerons are worked by a combination of bell cranks, cables, and push pull rods. Cables actuate the rudder, while the elevator and stabilizer are controlled by push pull tubes. Three tubes are supported in special graphite bearings which require no lubrication for a period of about two years. In this way the control bearings may be forgotten until such time as the fuselage is recovered. The stabilizer control consists of a lever and ratchet arrangement. The adjustment can be made simply and quickly by one motion from the pilot. An adjustment of $2\frac{1}{2}$ deg. is provided in either direction from neutral, thereby caring for any arrangement of landing position. This control, incidentally, is located in the middle of the cabin where it can be reached by either pilot or student. Although the plane was not designed as such it should prove a good training plane, for there seems to be a tendency towards closed cabins for training planes based on the argument that the student will later fly a closed cabin plane and will therefore be better off starting in such a model. The Stinson Junior lands at 46 m.p.h. with full load, which should prove slow enough for the training of pilots with a minimum of risk.

Fuselage Structure of Seamless Steel

The fuselage structure is made up of seamless steel tubing. It is rectangular in section with the tubes of the side panels welded into a modified Warren truss; the truss in the top and bottom panels forms a modified Pratt truss. The steel used is 1025-D throughout, with the exception of center section tubes and the various members around the door structure. The diagonal tubes, above and below the cabin crossing between the wing spars, intersect at their mid-points, where one tube is continuous with the other tube welded to it. A slot is cut through both tubes with a flat plate inserted in the slot. All the tubes are welded to this plate, reinforcing the joint. The tension caused by the lift struts attached to the lower longerons is carried across the fuselage by two flat strips of sheet steel in tension between the strut fittings. One of these flat strips is on each side of a tube that forms part of the fuselage truss. The strips are widened at the ends with a hole at the point through which the longerons pass.

Front view of the Stinson "Junior" powered with a Warner "Scarab" engine

Two of these strips thus form part of the fittings for the attachment of each set of lift struts. The rear turtle deck of the fuselage is built of spruce fairing mounted on steel tube frames, giving a well rounded and convex section at all points.

The wing is of wood construction with metal fittings and fabric covering. The two spars are of solid spruce routed to an I section. The routing is the same on both forward and rear spars, the spars varying only in depth, which makes for decreased production costs. There is no routing at the fittings, these occur at the same point on both forward and rear members. A Clark Y section is used having ribs of

Side view of the new Stinson "Junior" in flying position

trussed construction with square spruce cap strips and cross members joined with plywood gussets nailed and glued to the sides. The compression members between the spars consist of steel tubes welded into the form of a Warren truss. These are constructed of two horizontal compression members with the truss member welded between them. The truss member consists of a single tube bent back and forth between the horizontal members to form the diagonal bracing. These are welded to the horizontal members at each bend. Fittings are welded to the ends of the compression tubes to take the double square tie-rods for the drag bracing. As there is one compression tube at the top and one at the bottom, between each spar, this system of bracing works out very nicely, allowing very simple fittings for the attachment of the diagonal bracing. The ailerons are mounted on a continuation of these compression struts carried behind the rear spar where they form the aileron hinges. In front of the aileron hinge the wing is finished with a false spar made up of a sheet duralumin channel fastened in place by wood screws. The leading edge of the wing is covered with sheet duralumin on top and bottom in front of the forward spar. The trailing edge is a strip of duralumin folded along its longest dimension with the ribs fitted into the corner of the fold. The wing tip consists of a large diameter tube bent to conform with the planform of the wing. To provide for the turning of the tip, small diameter tubes are welded to this tube. These small tubes are approximately one quarter inch in diameter and, though requiring some very delicate welding work, give a light and strong wing tip.

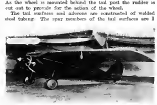
The wings are supported by two lift struts on each side of the fuselage, one to each spar. The struts are of steel tubing faired with balsa wood to give an Eifel 380 section. The forward struts are adjustable at the lower end to provide for rigging the wing. At a point near the bottom of the forward strut, the landing gear is attached. This point is braced by an additional member to the lower longeron and one to the upper longeron.

The landing gear hinges about the lower fuselage longeron with the shock absorbing member attached to the forward wing support. The shock absorber consists of a combination spring and hydraulic mechanism similar to that used on the larger Stinson model. It is quite simple in operation, having no metering pins or valves. There is an oil filled cylinder with a piston operating inside. The piston has several small holes and ring grooves in it, so that when the load is applied, the oil is forced through these holes, absorbing the springs. There are two of these, of the flat helical type. They provide for a travel of $5\frac{1}{2}$ in. so that there is a total vertical travel of the shock absorber of $7\frac{1}{2}$ in., two inches through oil alone and $5\frac{1}{2}$ in. through oil and spring. The oil behind the piston eliminates rebound. The two Hayes wheels are set nine feet apart; standard equipment includes 28 in. by 4 in. wheels, though for muddy fields 30 in. by 5 in. tires can be provided. The wheels are fitted with internal expanding brakes actuated by bell cranks and cables and operated from the rudder pedals. The axle tube of the landing gear is attached to the diagonal struts by a steel sleeve sweated to the axle and welded to the diagonal struts, thereby eliminating welding on the axle itself.

Wheel Mounted Behind Tail Post

The tail wheel, which consists of a small disc wheel with a 12 in. by 3 in. pneumatic tire, is mounted on a shock absorber in much the same manner as the front wheels. The hydraulic leg is of similar design to the front wheel shock absorber unit. The tail wheel is connected to the rudder by a shock absorber chord, and is thereby steerable without subjecting the pilot to the usual side landing bumps. The wheel is mounted behind the tail post. It moves almost vertically and has no tendency to reverse itself. This is said to prevent shimmying which is present in some designs. The steerable wheel enables the plane to be maneuvered on the ground in high side winds without the use of a ground mechanic. It is also very saving on the airport terrain. As the wheel is mounted behind the tail post the rudder is cut out to provide for the action of the wheel.

The tail surfaces and ailerons are constructed of welded steel tubing. The spar members of the tail surfaces are 1



The Stinson "Junior" owned by the Union Trust Co., Detroit, Mich., on display at the Detroit Show

in. by .035 in. tubing, while the ribs are 5/16 in. by .035 in. tubing. The control horns are welded directly to the spars. The spars of the ailerons are of Warren truss construction. They consist of two longitudinal tubes with smaller diameter tubes welded between. There are no ribs; the upper surface is supported by a Warren truss of 5/16 in. tubing welded between the upper spar member and the trailing edge, while the lower surface is supported in a similar fashion by tubes between the lower spar member and the trailing edge. The ailerons are controlled by push rods and bell cranks. The

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The Detroit Air-Olympics

Plans Nearing Completion for the Holding of the National Air Tour, Gordon Bennett Race and National Model Contest

By JOHN T. NEVILL

WITH A "pathfinder" plane now making a circuit of the 6,000 mi. jaunt to be made this year in the fourth annual National Air Tour, Karl S. Betts, assistant manager of the tour, and the Aircraft Events Committee of the Detroit Board of Commerce, sponsors of the event, are busily preparing for the classic.

The tour this year will become a major feature of the Detroit Air-Olympics, a name recently chosen for the three national and international aeronautical events to be held in Detroit on June 30. The other two events are the Gordon Bennett International Balloon Race, and the Boys' National Model Airplane Contest. The touring planes, taking off in the morning, will open the Air-Olympics and the balloon race will close the program, with the model plane contest, and demonstration of gliders sandwiched in between the two. All of the events are to take place at Ford Airport.

The pathfinding plane, carrying Ray Cooper, tour manager, Ray Collins, official travelling referee, and three Detroit newspapermen, took off from Ford Airport Monday, May 21. Cooper planned to be back in Detroit a week or two before the beginning of field tests preparatory to the tour.

The Proposed Route

On the preliminary flight over the proposed route, the tour manager expects to visit the following cities: Indianapolis, St. Louis, Springfield (Mo.), Wichita, Tulsa, Oklahoma City, Fort Worth, Waco, San Antonio, Sanderson (Tex.), El Paso, Tucson, Phoenix, San Diego, Los Angeles, Fresno, San Francisco, Oakland, Medford, Portland, Pasco (Wash.), Spokane, Missoula (Mont.), Great Falls, Glasgow (Mont.), Minot (N. Dak.), Fargo, St. Paul, Wausau (Wis.), Milwaukee, Chicago, and Battle Creek. The cities will be visited in the order named and all of them, at the present writing, are expected to be included in the main tour.

Present indications are that the tour this year will be bigger in every way than any of the previous tours. It will carry the competing planes to approximately 24 cities in 13 states, and will require at least 28 days to complete. Two day stops are planned for several of the stopovers.

Rules and entry blanks for the tour have been mailed to prospective competitors, Manager Cooper said, and the first entries are expected in at this writing.

Sixteen balloons have already been entered in the Bennett race, which event will be the seventeenth held since the international classic was established. Four nations, France, Belgium, Germany, and the United States, have entered three bags each, while England, Switzerland, Argentina, and Denmark have notified the National Aeronautic Association that they will enter one balloon each. This year marks the first time Argentina and Denmark have competed in the Bennett race.

The Detroit Balloon Club, in whose membership five men are holders of 22 of the 44 world balloon records, recently held a dinner-meeting at the Detroit Athletic Club and named pilots for four balloons to be entered from Detroit in the National Balloon Race—elimination contest for the international race—scheduled to be staged in Pittsburgh May 30. The winner of the national race will represent the United States in the Bennett race, one month later. Pilots named were Edward J. Hill of the Aircraft Development Corp., winner of last year's Bennett race, William Naylor, chief engineer of the Stinson Aircraft Corp., Dr. George M. LeGallee, Detroit physician and nationally known balloonist, and George Hineman. Hill will pilot a bag entered by the People's Outfitting Co., owner of the winning bag last year, and will have Arthur G. Schlosser, his companion on the prize winning flight, as aide. Hineman, pilot of a balloon sponsored by the Detroit Chamber of Commerce, will carry Ernest Johnson, as aide. Aides for the remaining two Detroit entries, both of which are owned by the Detroit Balloon Club and will be sponsored by the *Detroit News*, have not been selected.

Judge Henry S. Hulbert of Wayne county probate court, president of the Detroit Balloon Club, and ardent ballooning enthusiast has been appointed by the Aircraft Events Committee of the Board of Commerce as chairman of the balloon

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The start of the 1927 Gordon Bennett International Balloon Race. The "Dux", the Italian entry can be seen just leaving the ground.

Reducing *the* Cost *of* Fire Insurance

By WILLIS PARKER

RATES CHARGED for various types of insurance sought by the airplane manufacturer are so high that any little saving effected is noticeable in the overhead expense. The industry is young, but growing. Many of the small firms will be expanding their facilities, remodelling or rebuilding their factories, and they should, at those times, consider their fire insurance costs.

By making a few changes in their present factory building and incorporating many improvements in the new unit structures being added, the Swallow Airplane Co. of Wichita, Kan., has been able to reduce its fire insurance rates from $4.50 a hundred to $1.80—quite a saving in the course of a year, two years or more. And, to better describe the company's new plant, we may well picture it from the fire insurance angle.

At the outset the new buildings are of brick, steel, concrete construction. The first building was such, but, in an effort to add more attractive architectural features, a few additional fire hazards were incorporated. These had to be removed to reduce the fire hazard and also the insurance rate. For example the ceilings of the present office and warehouse were covered with wall board and other such materials to hide the rough beams and boards in the construction. The walls were sheathed, also, and there was sufficient of such construction to classify the building as "ceiled" instead of "open finish". By removing sufficient sheeting and ceiling so that not more than 5 per cent. of the total building was ceiled, a reduction of ten cents on each hundred dollars insurance was obtained.

Rate Reduced 40 Cents a Hundred

The handling of "dope" and wood working in the same building with the acetylene or gas welding constitutes a hazard that the insurance companies consider worth penalizing. Eliminating all woodworking, both hand and power, from this building reduced the rate 40 cents a hundred. The discontinuance of all painting and the storage of dope in the building caused another $1.00 to be taken off the rate.

Elimination of the storage of gasoline for any purposes whatsoever brought a cut of 30 cents. The discontinuance of the use of gas torches and using only oxy-acetylene, electric or natural gas portable devices would give a 12 cent reduction, while a re-wiring of the building for electricity would reduce the rate 15 cents.

If the company will not permit the storage of extra acetylene or oxygen tanks other than those actually connected to welding devices in the building a reduction of 12 cents will be granted.

A reduction of 12 cents also is given for replacing of any open or brush type electric motors with "straight induction" or totally enclosed types.

Small as it may seem, metal lockers for workmen's oily clothing gives the firm the advantage of 5 cents a hundred reduction in the rate. Another five cent reduction comes from the installation of standard metal waste cans with self-closing hinged lids in all locations where oily rags are used or accumulated.

Concrete floors instead of wood reduce the rate, so wherever possible wood floors in the old factory will be replaced with concrete and if it is possible to make 95 per cent of the floor area concrete it will reduce the rate 10 per cent. A nine cent reduction will be granted when the placing of stove pipes through combustible roofs and the openings thus occasioned are permanently closed, is discontinued.

The recommendations of the fire insurance agents will be carried out in remodelling of the old factory building, says Victor Roos, general manager of the company, as will the recommendations made with the erection of the new buildings or units to the factory.

The wood working and dope departments are being housed in a building separated from the old factory building by a 20 ft. driveway. But a fire wall will separate the two departments and extend 18 in. above the roof. This will make it necessary to move the material outside of the building when shifting it from one department to another, but with wide doors, a concrete runway, which can be covered with a light canopy which is not connected with the buildings and thus protect the materials and the workmen in bad weather, it will

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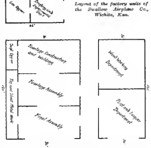

Layout of the factory units of the Swallow Airplane Co., Wichita, Kan.

Rules *of the* 1928 National Air Tour

THE EDSEL B. Ford Reliability Trophy, donated by Edsel B. Ford, shall be competed for annually by commercial airplane manufacturers. Entrants must show to the satisfaction of the Contest Committee of the N.A.A. that they are bona-fide manufacturers.

(2) This contest shall be in the nature of a cross-country tour from city to city and shall be conducted over a course and under such rules as may be prescribed from time to time by the Contest Committee of the National Aeronautic Association.

(3) The Edsel B. Ford Trophy shall be awarded each year, to the entrant of the winning airplane, subject to the rules and conditions hereinafter set out, who shall be entitled to possession of the Trophy until one month prior to the next succeeding contest at which time he shall deliver the Trophy to the Contest Committee of the National Aeronautic Association. A suitable bond for the proper care and return of this Trophy shall be required by the National Aeronautic Association from each person or organization into whose possession the Trophy may be delivered.

(4) The Edsel B. Ford Reliability Trophy shall become the permanent property of any manufacturer who shall win it on three consecutive occasions, and shall not, without his approval be again contested for.

(5) In order to stimulate entries among civilian constructors and civilian pilots, both in the United States and abroad, government-owned planes will not compete in this Tour.

(6) For the purpose of this Contest, at least four entrants shall be represented with a minimum number of contestants not less than ten. In the event that total entry list does not aggregate ten contestants representing at least four entrants no contest shall be held.

Rules and Conditions for 1928

(7) Each airplane entered in the National Air Tour shall be capable of a speed in excess of eighty (80) miles per hour with a full contest load, and shall be required to demonstrate this speed before being allowed to compete in the Tour.

(8) No airplane shall be eligible to compete in the National Air Tour of 1928 unless an Approved Type Certificate has been issued by the Department of Commerce of the United States for that particular type of airplane.

(9) An exception to this may be granted to entrants who have not yet received Approved Type Certificates from such Department, provided they have filed application for such certificates with the Department together with the supporting data required by the Department, on or before June 15, 1928, thus enabling the Department to determine by a suitable check thereof, together with an inspection and flight test of the airplane involved, whether it is in order to issue an experimental license for the purpose of the Tour. The acceptance of such entries shall be optional with the Tour management.

Contest Load.

The contest load is the load which the entrant desires to put in the plane providing the following load conditions exist to the satisfaction of the Contest Committee:

(a)—Under no circumstances shall the contest load exceed the maximum useful load permitted by the Department of Commerce under the approved type certificates awarded the plane.

(b)—This contest load may consist of passengers, inert and useless ballast, or both, and must include the weight of the pilot and the weight of gasoline with the tanks full. Tools, spare parts, cockpit covers may be included in the contest load when properly sealed and marked.

(c)—For the purpose of the stick and unstick and maximum speed tests, the contest load will consist of passengers

Eddie Stinson (right) and party standing in front of the Stinson-Detroiter which he flew to first place in the 1927 Tour

and ballast, or ballast in addition to full tanks of gasoline and in sufficient quantity to bring the contest load of the plane up to maximum useful load permitted by the Department of Commerce for each ship. After the stick, unstick, and maximum speed tests have been completed, the entrant may reduce his useful load to 75 per cent. of the maximum permitted by the Department of Commerce and still be given credit for 100 per cent. in the formula. Realizing that gasoline is a part of the useful load specified under the regulations of the Department of Commerce and that the weight of gasoline varies with the distance traveled, each plane will be required to leave each control with full gasoline tanks. The same will apply to oil tanks except that a margin of 25 per cent. of the capacity of oil tanks will be allowed for expansion. Upon arrival at each control, each entrant will be required to account for a full 75 per cent. of the maximum useful load permitted by the Department of Commerce es-

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N.A.C.A. Progress

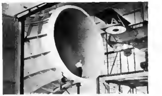
Industry Delegates Witness N.A.C.A. Equipment Demonstrations at Third Annual Conference Held at Langley Field

COOPERATION WITH the aircraft industry and the expression of a desire to help commercial manufacturers to solve their problems was the salient feature of the Third Annual Conference of the National Advisory Committee for Aeronautics which was held at Langley Field, Va. on May 15. About 95 members of the industry attended, most of them being the heads of aircraft companies or chief engineers. That is a greater number than has attended any previous conference, and though there was a preponderance of military manufacturers, many of the more progressive commercial manufacturers sent representatives.

As it will be remembered, the National Advisory Committee for Aeronautics was started in 1915 in order that the United States might have an independent body to which the government services, and especially the Army and Navy, might go for technical information about matters aeronautical. Information was to be gathered and fundamental research of aerodynamic problems was to be undertaken. The organization proved of such value that the appropriations were gradually increased, it now has, including the Washington staff, a total personnel of about 250, and received an appropriation of $550,000 last year.

At first, work was done mostly for the Army and Navy, but as facilities have increased, the aircraft industry has become more and more interested in what is being done. Information on the data gathered and on the actual experimental work at Langley Field is sent out in a series of technical bulletins which are of great value to the engineers of the country. The conferences of the industry and the N.A.C.A. have brought about closer coordination of the theoretical work being done and the practical needs of the military end of the industry. With the growth of the need for better engineering of commercial aircraft, it is hoped that designers of civilian planes will formulate their needs and problems, so that they may more fully profit by the wonderful facilities available.

The present experimental plant at Langley Field is probably as complete as any in the world. To the outsider, the most striking piece of apparatus is the wind tunnel which blows a jet of air 20 ft. across a maximum velocity of 110 m.p.h. The eight bladed propeller which circulates this air is driven by two 1,000 hp. Diesel engines. The size and speed of this tunnel enable tests to be made on full sized airplanes with their engines running. In an ordinary wind tunnel it is not possible to measure the effect of the slipstream of the



Mouth of the 20 ft. N.A.C.A. wind tunnel showing method of calculating actual flight conditions

plane's propeller and its reaction on the fuselage and wings. This is an important factor in design, but at present little is known about it. A Whirlwind engined cabin monoplane is now being tested in the tunnel. A variety of different cowlings are being tried and electrical thermometers are placed on various parts of the engine and cylinders. It is hoped that interesting results will be obtained, not only as to the best form of cowling from an aerodynamic standpoint, but

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Group picture of delegates who attended the Third Annual Conference of the National Advisory Committee for Aeronautics.

Fuselage Analysis

Stress Analysis of Commercial Aircraft, Chapter Number Twelve

By PROFESSOR ALEXANDER KLEMIN
Daniel Guggenheim School of Aeronautics
And GEORGE F. TITTERTON
Late of the Bureau of Aeronautics, Navy Department

IT IS the common practice to solve the fuselage truss graphically. This method is probably less lengthy than the analytical method and has the added advantages of providing a check on the work and of actually picturing the magnitude of the stresses. Its disadvantages are that some time must be taken to set up the truss accurately for solution and exceptionally accurate drawings of lines and angles are required if the diagram is to close. Before starting to analyze we must be quite sure that the forces acting on the truss are in equilibrium. If the forces are not in perfect equilibrium the diagram will not close and the analysis must be repeated.

As explained in the last part of Chapter 1, in doing graphical work it is advisable to construct the force polygon first—that is, a polygon of all the external forces acting on the truss. If this diagram closes we are sure that our X and Y forces balance but the moment equilibrium must be checked independently. It should also be borne in mind that if we take the members in rotation clockwise about any panel point, those stresses which we draw in our polygon toward the joint are in compression, and those leading away from the joint are in tension. A letter should be put on each side of every member and force of the truss and the lines in the polygon named as they are drawn.

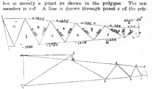
The force polygon must of course be drawn to a convenient scale. For a 2,000 lb. plane a scale of about 300 lb. to the inch will give a fairly large size polygon. The larger the polygon the greater is the accuracy but too large a size becomes unwieldy and errors other than measurement creep in. The polygons to be published in this series have been solved with scales from 250 to 500 lb. per in. but in publishing, the printer will reduce the size to fit the page and so the scale will no longer hold true. To determine the scale of the printed polygons measure one line of known magnitude and divide this magnitude by the measurement in inches.

In the first three conditions that will be dealt with, namely, maximum stabilizer and elevator load, maximum fin and rudder load, and nosing over, it is not necessary to analyze the entire truss of the fuselage. These three conditions are fairly easy and enable one to become familiar with the methods of graphical analysis.

Maximum Stabilizer and Elevator Load

In this condition a required load per square foot must be applied at the tail post and the side truss of the fuselage analyzed as far forward as the rear of the cabin. In the previous Chapter we found that 30 lb. per sq. ft. is the load required on our horizontal tail surfaces. In Fig. 55 of Chapter 8 the area of the stabilizer and elevator is given as 34 sq. ft. The load on the tail post is then $30 \times 34 = 1020$ lb. Half this load has been applied at the tail post and a graphical solution made in Fig. 72. Only half the load was used because only one side of the fuselage is being analyzed.

The original scale of this drawing before reduction for printing was 250 lb. equals one inch. It is to be noted in the lettering that a represents all the area to one side of the external force of 1020 lb. and b represents all the area on the other side. This force is then represented by a-b which is its designation in the polygon. It is to be noted that the tail post and the rear section of the lower longeron both have zero load. This is due to the fact that the truss is complete without these two members as far as this condition is concerned. Let us follow through the first panel point solution to see if we understand the method. We have our external force a-b acting vertically downward with a force of 1020 lb. A line a-b is drawn below in the polygon to a definite scale and parallel to the line a-b acting on the truss. Proceeding clockwise about the panel point we come to member b-c (tail post) which we just said was zero and therefore b-c is merely a point as shown in the polygon. The next member is c-d. A line is drawn through point c of the poly-



Max Stab + Elev Load
Fig 72

gon parallel to c-d in the truss and indefinite in length. The next and last member at this panel point is d-a. Through the point a in the polygon a line is drawn parallel to d-a until it intersects the line c-d which was drawn last. This point of intersection is the point d. Now by measuring c-d and d-a and multiplying by the scale to which a-b was originally drawn we can obtain the stresses in these members.

The force a-b is acting downward and in our polygon it is so lettered that when we read a-b we go from top to bottom—i.e. in the direction in which the force is acting. If we now read c-d on the polygon we go from lower left to upper right. This is acting right towards the panel point we just analyzed. The force in c-d then is pushing toward the panel point and the force is compression. A compression force of 1760 lb. was obtained by measurement and this is noted in the truss and indicated by —1760. Minus indicates compression and plus indicates tension. Reading the force d-a on the polygon this acts from right to left or away from the panel point. It is therefore in tension. Its magnitude and

character is indicated by +1430 on the truss. The rest of the truss is analyzed in the same manner until the loads become very small and are no longer critical.

Maximum Fin and Rudder Load.

In this condition it is assumed that the vertical tail surfaces have a load per square foot of three-quarters the magnitude of the horizontal tail loading. The horizontal tail loading was 30 lb. per sq. ft. and so the load for this condition is $30 \times 3/4 = 22.5$ lb. per sq. ft. The area of the vertical surfaces as given in Fig. 55 was 13 sq. ft. The total load is then $22.5 \times 13 = 292.5$ lb. This load is acting at the center of pressure of the vertical tail surfaces. This point is usually assumed as the geometrical center of the surfaces—that is, a point is selected that has as much area above it as below, and as much in front as in back. Unless the rudder is entirely unconventional, the fore and aft distribution of area is neglected and the point placed somewhere along the rudder post at the proper height to give equal areas above and below. In our case this point is about three inches above the upper longeron.

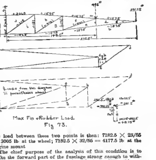
The force of 292.5 lb. acting three inches above the upper longeron puts the fuselage structure in torsion. It is rather difficult to analyze for torsion and as the loads are small a compromise is made. In the lower right hand corner of Fig. 73 is a little diagram showing the tail or rudder post of our plane. The force of 292.2 lb. is acting three inches above the upper longeron which in turn is 18 in. above the lower longeron. If we take moments about the lower longeron we will obtain the force necessary at the upper longeron to maintain equilibrium. Thus $292.2 \times (18 + 3)/18 = 341.25$ lb. acting at the upper longeron. For equilibrium sideways a force of 48.75 lb. must be applied at the lower longeron. If the upper truss is now analyzed for a load of 341.25 lb. acting at the rear point of the longerons, stresses will be indicated in the members which will be perfectly conservative. Similar members in the lower truss will be assumed to have the same stresses as the members of the upper truss.

In Fig. 73 the upper truss of the fuselage has been analyzed as far forward as the rear spar of the wing. The full-line polygon indicates the analysis as at first made. In this analysis members c-d, d-e, e-f, f-g, g-h, do not carry any loads. This is due to the fact that the two longerons with member h-i form a triangle which is a rigid structure in itself and does not require any internal bracing. Now however if the internal bracing was omitted the length of the longerons would be so long that very heavy tubes would be required to take the loads. To break up the column length of the longerons and to make the rear portion of the fuselage more rigid other members are inserted. In the full-line polygon these members are all represented by a point which indicates they carry zero load. When the longerons change direction at member h-i, the inner members begin to be stressed as shown in the full-line polygon by h-i, and i-j.

To obtain some idea of the loads in the inner members which show to be zero in the full-line polygon the following method has been employed. The line of the rear spar is taken as a reference point. It is desired to place one panel point in from the tail a load that will have the same effect on the reference point as a load of 341.25 lb. at the tail. Taking moments about the reference point this load must be $341.25 \times 215.5 / 148.5 = 495$ lb. This load is applied at the desired panel point and indicated by a dashed arrow in Fig. 73. The analysis is then made from this panel point back as illustrated in the dashed polygon. Loads are obtained in e-f, f-g, and g-h. These members probably do not truly carry these loads but they are at least an indication upon which the design of the members can be based. These members are usually very small and it is usually possible to use the minimum size and gage of tubing that welding considerations will allow. The Commerce Department specifies minimum sizes of tubing that may be used. These will be given later.

Nosing Over Condition.

In this condition the plane is assumed to be resting as shown in Fig. 74. The weight of the plane times the three point landing load factor is acting vertically downward through the center of gravity. In our plane this load is $2210 \times 6.5/2 = 7182.5$ lb. This is only half the total load of the plane but our analysis is being made for only one side of the fuselage and this will give the true loads in the members. The line of action of this load cuts the ground 23 in. from the point of contact of the engine bearer and 32 in. from the point of contact of the wheel. The distribution of



Max Fin + Rudder Load.
Fig 73.

the load between these two points is then: $7182.5 \times 23/55 = 3005$ lb. at the wheel; $7182.5 \times 32/55 = 4177.5$ lb. at the engine mount.

The chief purpose of the analysis of this condition is to make the forward part of the fuselage strong enough to withstand the nosing over loads. It is desired that if anything is to fail it be the landing gear so that the plane will assume a horizontal attitude. With this in view the landing gear is not analyzed for this condition but only the forward part of the fuselage. The load of 3005 lb. acting at the wheel is then not carried through the landing gear but left as it stands. The load of 4177.5 lb. is carried through the front portion of the fuselage structure.

The two upper members of the engine mount do not take any load as the structure is complete for this condition without those members. The loads in the other members of the fuselage and engine mount are rather severe and it is usual that the engine mount is designed by these loads.

Balance Diagram.

At this stage of the analysis it is essential that we know the exact distribution of our weights. With this in view we have constructed a balance diagram in Fig. 75. The items are placed exactly as called for in the balance table which was published in Chapter 10 in analyzing the landing gear. The horizontal reference line, the front face of the rear propeller flange is located on the diagram; the vertical reference line, the thrust line is also drawn on the diagram. All dimensions are given with reference to these datum lines.

In deciding upon the center of gravity position of any par-

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Aviation and Railroad Companies Combine To Offer Coast-to-Coast Air-Rail Service

NEW YORK to Los Angeles passenger service combining airplane and rail travel is to be inaugurated shortly—before the close of the year, it is expected—by a newly formed $5,000,000 company—the Transcontinental Air Transport, Inc. This statement has been authorized by C M. Keys, president of the Curtiss Aeroplane & Motor Co and head of the new concern, which represents the Ford Motor Co., the Wright Aeronautical Co., the National Air Transport, The Pennsylvania Railroad, and the Atchison, Topeka, and Santa Fe Railroad, as well as the Curtiss concern. A powerful banking group headed by Blair & Co., Inc., Wall Street firm, is backing the project

The first service to be inaugurated by the company will permit passengers to leave New York on the Pennsylvania Railroad at 6·05 in the evening, take an airplane at a point near Columbus, O., after breakfast in the morning, stop for lunch at St Louis, and continue the flight to Wichita, Kan., in the afternoon; transfer to the Atchison, Topeka, and Santa Fe Railroad train to a convenient point in New Mexico, and fly the next day into Los Angeles, arriving there late in the afternoon. The New York to Los Angeles trip by this route will require two days. This compares with four days required at present to make the trip by fastest railroad connection

To Use American Planes Throughout

American planes are to be used throughout, it is asserted Operations are to commence with tri-engined planes carrying 12 to 14 passengers each The flying speed on which the schedule is based is 90 m p h., but it is expected that greater speeds will be in order By basing its schedule on a 90 m p h speed, the company permits enough leeway to offset delays by trains. A 120 m p.h. maximum speed will be stipulated for planes used

Asked concerning the type of planes, the statement was made that various kinds would be used Ford-Stout planes would be among these Curtiss, Boeing, and Fairchild planes are also considered as members of the completed fleet The route selected is believed to be the best for year round flying. the rates will represent a "reasonable advance" over present rail fares

The first Board of Directors will be as follows.

Harold Bixby, president of the Chamber of Commerce of St. Louis

Howard E Coffin, chairman of the Board of National Air Transport of Detroit.

J. Cheever Cowdin of Blair & Co, Inc., of New York

Chester W Cuthell, chairman of the Air Law Committee of the American Bar Association.

Thomas Eastland of Bond & Goodwin & Tucker, Inc., of San Francisco

Julian L. Eysmans vice president, Pennsylvania Railroad in charge of traffic.

Fred Harvey of Kansas City, representing the hotels and restaurants along the Santa Fe route.

Paul Henderson of Chicago, vice president of National Air Transport, Inc.

Richard Hoyt of Hayden, Stone & Co.

Leonard Kennedy, capitalist.

C M Keys, president of the Curtiss Aeroplane & Motor Co

Harry B Knight of Knight, Dysart & Gamble, St. Louis

Charles L. Lawrance, president of Wright Aeronautical Corp.

Walter Marvin of Hemphill, Noyes & Co

William B Mayo, chief engineer of the Ford Motor Co.

Earle Reynolds, president of National Air Transport, Inc.

Daniel M. Scheaffer, chief of Pennsylvania Passenger Transportation

James C Willson of J C Willson & Co. of Louisville, Ky

William H Vanderbilt

The company also plans to inaugurate in the near future additional air services, particularly in the Eastern and Middle Western States, connecting the Transcontinental route with all principal cities

The general plan is to arrange the schedules in such a way that passengers will travel at night by rail and fly by day Among the other routes now in contemplation is a branch from Chicago to the Twin Cities. St. Louis and Kansas City will be on the Transcontinental line and other western metropolises will eventually be linked to the line either by airplane or railroad connection.

Principal landing fields will be maintained near Columbus, O., and in New Mexico for the transcontinental route. Others will be established at various points throughout the country, wherever traffic needs justify. It is the intention to draw traffic both north and south to feed the main artery of travel Airplane schedules will be so adapted as to make convenient connections with limited trains.

Coolidge Signs Measure Reducing Air Mail Rate and Allowing Long Carrier Contracts

PRESIDENT COOLIDGE has signed the bill (H R 8337) amending the Air Mail Act of Feb 2, 1925, as amended by the Act of June 3, 1926 With the measure passed, the air mail rate will be changed from 10 cents for each ounce or fraction of an ounce to five cents, and the Postmaster General will be authorized to grant air mail contracts of 10 yr in length.

The amendments read as follows

"Sec 3 That the rates of postage on air mail shall not be less than five cents for each ounce or fraction thereof."

"Sec 2 That after section 5 of said Act (United States Code, Title 39, section 465) a new section shall be added as follows:

Ten Year Contracts

"Sec 6 That the Postmaster General may by negotiation with an air mail contractor who has satisfactorily operated under the authority of this Act for a period of two years or more, arrange, with the consent of the surety for the contractor and the continuation of the obligation of the surety during the existence or life of the certificate provided for hereinafter, for the surrender of the contract and the substitution therefore of an air mail route certificate, which shall be issued by the Postmaster General in the name of such air mail contractor, and which shall provide that the holder shall have the right of carriage of air mail over the route set out in the certificate so long as he complies with such rules, regulations, and orders as shall from time to time be issued by the Postmaster General for meeting the needs of the Postal Service and adjusting air mail operations to the advances in the art of flying *Provided*, That such certificate shall be for a period not exceeding 10 yr from the beginning of carrying mail under contract. Said certificate may be canceled at any time for willful neglect on the part of the holder to carry out such rules, regulations, or orders, notice of such intended cancellation to be given in writing by the Postmaster General and 60 days provided to the holder in which to answer such written notice of the Postmaster General The rate of compensation to the holder of such an air mail route certificate shall be determined by periodical negotiation between the certificate holder and the Postmaster General, but shall never exceed the rate of compensation provided for in the original contract of the air mail route certificate holder"

Bremen is Damaged as Melchior Attempts Take Off From Greenely Mainland Runway

FLYING IN their two Loening Amphibian planes, Major General Fechet, Lieutenant Quesada, Captain Eaker, and Fred Melchior, Junkers pilot, attained Greenely Island on May 19 to retrieve the trans-Atlantic monoplane Bremen. Because landing conditions were found unfavorable, Melchior dropped in a parachute to the mainland tract to which the Bremen had been removed Next day he took the plane into the air; but after reaching a height of a few feet, the Bremen fell to the ice, the impact badly damaging the left side of the fuselage, the left wing, the undercarriage, and propeller, according to reports.

One of the two Loening Amphibians stopping in the slip at St John, N. B, on its way to Greenely Island

Dr Cuisinier and his mechanic, Thibault, both of the Canadian Transcontinental Airways Co., accompanied Melchior in the flight It is said that only a few bruises were suffered by the men

No further attempts to fly the Bremen to New York will be made because of the seriousness of the damage. It has been decided to place the monoplane on the first steamer and take it to some airport for repairs.

B. F. Mahoney Aircraft Corp. Will Move Into Lambert-St. Louis Factory June 15

THE B F Mahoney Aircraft Corp, maker of Col Lindbergh's Spirit of St. Louis, will move into its new factory at Lambert St Louis Field about June 15 and will produce its first airplane here about August 15, John C Nulsen, vice president and general manager of the firm, has announced. Nulsen, who has been directing operations at the company's plant in San Diego, said the demand for airplanes is far outstripping the ability of his company to supply them

The Lambert Field factory will start off with a production of 25 planes a month, Nulsen said For the present the only model will be the Ryan Brougham, the five passenger enclosed cabin monoplane.

In its west coast factory the Mahoney concern produced five planes in February, 10 in March, and 15 in April For May a production of 20 is planned. The factory will be kept in operation after the local factory is opened, to meet the demands of Pacific Coast trade The Lambert-St. Louis Field factory, now approaching completion, is to employ about 150 workmen and will include a completely equipped office

Nulsen said that besides domestic orders, which include all the planes made up to July, the company has several foreign orders, including one from Warsaw, Poland, for plane resembling Lindbergh's "Spirit of St. Louis" It is to be used in a projected around-the-world flight Another plane is being built for Capt. Emilio Carenza, the Mexican airman, who plans a good will tour to the United States as a return courtesy for Lindbergh's visit to Mexico Still other planes have been sold in Rome, Paris, and Australia.

Colonel Lindbergh Accepts Position With Air-Rail Company

WORD HAS been received, as we go to press, that Col. Charles A. Lindbergh has become chairman of the technical committee of the newly-formed Transcontinental Air Transport, Inc, which is to operate a combination airplane and railroad service from New York to Los Angeles The Colonel will assume duties at once, it is said, with the technical committee, which is to arrange for equipment, fields, and general service of the transcontinental line. A story concerning the new company appears on page 526 of this issue.

French Air Mission Now in United States To Study Our Civil Aviation and Industry

ELEVEN FRENCH aeronautical experts, members of a special mission appointed by the French Committee for the Development of Aeronautics has arrived in New York City. The party plans to spend several weeks in this country studying civil aviation and United States airplane and equipment factories. Leighton W. Rogers, Commerce Department Commercial Attache, is accompanying the mission on its tour.

The French Committee for the development of aeronautics is an important organization in France supported by the French Government, and French industry acting through the French Chambers of Commerce. Its president is Field Marshall Lyautey, who, however, will not accompany the mission to the United States. Each year the Committee has sent a mission to some foreign country to study aeronautic developments—last year visiting Germany

The Department of Commerce has arranged to place at the disposal of the mission two passenger planes in which the party will be transported from point to point. Chambers of Commerce in each city visited will receive the party and will arrange for visits to airports, manufacturing plants and other places of interest.

The personnel of the mission follows:

General Boucabeille, retired, French Army, Andre Michelin, French tire manufacturer, Dr Adb El Nour, president of the Aero Club of Ardennes, de Montgolfier, Chamber of Commerce of Troyes, M H Kahn, technical director and inventor, Fournier, Chamber of Commerce of Paris, Pinchot, Chamber of Commerce of Paris, J Jove, Banker of Tourcoing; d'Anglejean, official of the France-South America air mail service, Barth, Engineer representing French railroads; and Andre Wateau, commission member

Henry C. Yeiser, Jr., is Elected President Of the Metal Aircraft Corp. of Cincinnati

HENRY C YEISER, Jr., president of the Globe-Wernicke Co, Cincinnati, has been elected president of the Metal Aircraft Corp, which has been formed to manufacture the all metal Helpin "Flamingo" monoplanes. Other officers elected were Julius Fleischmann, Powel Crosley, Jr, Thomas E Halpin, and Ralph R. Graichen, vice presidents; John B Hollister, secretary, and Daniel Schryver, treasurer. Halpin will be general manager as well as vice president of the new company, which has taken over assets of the Halpin Development Co The organization now has about $500,000 paid-in capital Directors elected by the stockholders were. Messrs Yeiser, Fleischmann, Halpin, Graichen, Hollister, T. S Goodman, Eschelby F. Lanken, John C Hermann, T. Higbee Embry, W. H. Chatfield and John J. Rowe.

New Airway Marker Called "Aerovane" Is Demonstrated at Wichita Conference

A NEW standardized airway marker combining three points of guidance for passing pilots—namely, wind direction, compass bearing, and the name of the community—has been brought forth by the Aerovane Utilities Corp. of New York City. It is proposed that these markers be placed on every main highway leading into towns and cities of the United States.

The new marker, called the "Aerovane", was demonstrated and shown for the first time at Wichita, Kan, recently at the Airways Marking Conference which met to consider ways and means of perfecting an organization to mark the nation's main air routes. The system has received the approval of many leaders in the industry, as well as the unofficial approval of William P. MacCracken, Assistant Secretary of Commerce in charge of Aeronautics.

The rights to the new marker have been taken by the newly-formed Aerovane Utilities Corp at 292 Madison Avenue, New York, a subsidiary of B Nicoll & Company of the same address. The Aerovane Company has been organized under the laws of the State of Delaware, with the following officers and directors: John J White, president; D A. Griffith, vice president; J. E Doran, second vice president; J. G Mahony, secretary and treasurer.

"Aerovane" erected at Wichita, Kan, for demonstration.

The new airways marker consists of a structural steel pole, six inches in diameter, and 25 ft. in height. Anchored at the very tip is a wind-sock, three feet in length. Located eight feet below, and centered on a horizontal plane, is a large arrow, 13½ ft. long. This arrow, painted a chrome yellow, has the name of the town to which the arrow is pointing, lettered in black. On the tail of this arrow, which is a three foot square painted in black, is superimposed a smaller arrow, painted white, which is in a fixed position pointing true north.

Located six inches below this large arrow, is a sign board, eight by three in size, for road travel information. On it, painted in white letters, will be carried the name of the town, and, perhaps, its slogan. Hanging from this sign, one on either side of the upright, will be two circular panels, 42 in in diameter, which will be rented by the leading business interests of the community, and which provide the revenue for erection and maintenance of the airway marker. Officials of the Aerovane Corporation claim that the arrow is easily visible under normal conditions at a minimum height of 3,000 ft., and that the lettering designating the town or city, is visible easily at a height of 1,000 ft. Thus, with these new airways markers in position, it is pointed out, the pilot is saved the trouble and loss of time in flying at random over a community looking for the name which may or may not be painted on the roof of a building, or diving low enough to read the name from the railroad station. With respect to the practicability of the new airways marker for direction finding during night flying, provision has been made for electrically flood-lighting the arrow whenever desired.

Three Massachusetts Airports are Added To American Airports Corp. Eastern Chain

ADDITION OF three Massachusetts airports to the network of chain-managed air transportation bases which it is developing in the eastern section of the United States, has been announced by the American Airports Corp of 527 Fifth Avenue, New York. Stedman Hanks, president, also made public the fact that work is beginning on a new airport at Pinehurst, N C, to be known as the Mid-South Airport.

The three Massachusetts airports to enter the unified management system are the Lowell Airport, the Springfield Airport, and the Webster Airport near Worcester. These and the Mid-South Airport are to be linked up with the Schenectady Airport and the Newark Metropolitan Airport, now in course of construction.

Starting with the Massachusetts airports, Colonel Hanks said, the corporation will develop a chain extending to all New England states, with a district supervisor in charge. The three initial units are said to represent an investment of $1,500,000 and are now in operation. Arrangements are being made to provide them with special facilities to accommodate air traffic to Maine this summer.

Negotiations for the management of the New England airports were carried on with General Butler Ames and Joseph Legare of the Lowell Airport, Frank and Harry Tait and James B. Moriarity of the Springfield Airport, and Dr Ernest E Smith, Daniel W. Lincoln, and the officers of the Worcester Flying Club, for the Webster Airport. The American Airports Corp had obtained an interest in the airports but the ownership will remain with local men in each instance.

The organizers of the Mid-South Airport include Jackson Boyd and Frank Buchan of Southern Pines, Richard and James Tufts of Pinehurst, and Henry Page, Jr, of Aberdeen, N C

To Develop Southern Chain

The American Airports Corp intends to make the Mid-South Airport its division headquarters for the development of a chain-management system of airports in the South. The airport's initial field will have an area of 150 acres. Work on the preparation of runways, the building of hangars, machine shop, administration and weather service quarters, and the construction of a beacon and lighting system for night flying, is to begin shortly.

The Newark Airport, for which the American Airport Corp. is acting as engineers, will be dedicated and opened, he said, around August 1. It is designed to serve as both a national and international air terminus in the New York metropolitan district, for chains of airports to the north, south and west.

The Schenectady Airport, in which the American Airports Corp owns an interest, is being developed as the main junction point between New York to Canada and New England to the West air traffic. In this capacity it is already serving the Colonial Western and the Canadian Colonial air transport companies.

Major Lutz Wins Curtiss Marine Trophy Flying Hawk Plane at 157 M.P.H. Average

MAJ CHARLES A. Lutz, veteran of the Marines and commanding officer of Brown Field, Quantico, Va, won the Curtiss Marine Trophy Race held at Washington May 19, by flying his Curtiss Hawk (D-12 engine) over the 100 mi. distance at an average speed of 157.60 m.p.h. Although one of 17 original starters in the seaplane classes of America, Major Lutz received keen competition from only two other planes, both of which were Hawks equipped with the Pratt & Whitney Wasp engines. These were piloted to second and third place, respectively, by Lieut. Comdr. A. C. Miles of the Naval Air Station, Anacostia, at a speed of 154.10 m.p.h. and Capt Harold C Major, U S M C, of the Bureau of Aeronautics, at a speed of 151.72 m.p.h.

Major Lutz has been flying for five years. Immediately after receiving his wings, qualifying him as a naval aviator, from the training school at Pensacola, Fla., Major Lutz struck out for post graduate work and obtained admittance to all the special schools in the Navy and Army.

The contest this year in reality was a demonstration, at high speed, of the Navy's service type airplanes. The entrants were divided into five classes. Fighters, represented by Hawks, Fleet Spotters, in the form of Vought Corsairs;

...retary of the Navy Wilbur congratulating Major Lutz, ...f the Curtiss Marine Trophy, which is shown in the background

Loening Amphibians, two with air cooled and two with water cooled engines, as general purpose observation types; Martin T3M-2 Torpedo and Bombing planes and Consolidated NY-2 (Whirlwind) training planes. As it is obvious that the fastest type of these five would cover the course in the shortest time and hence win the Trophy, prizes were offered by the *Washington Evening Star* to the winners of the various groups, as an inspiration to enter the race.

Edward P. Warner, assistant secretary of the Navy for aeronautics, donated a handsome silver cup for the pilot who flew his plane closest to the known official high speed performance for that particular type. This cup also was captured by Major Lutz for giving the best high speed performance of all types in the race.

The group winners were: Lieut. W. G. Tomlinson of the Naval Air Station, Anacostia, training planes, average speed 92.95 m.p.h.; Lieut. Comdr. W. K. Harrill, aid to Mr Warner, fleet spotter class, 149.61 m.p.h.; Lieut. B. E. Grow of the Aircraft Squadrons, Scouting Fleet, Amphibian class, 116.90 m.p.h.; Lieut. D. V. Gallery, also from the Fleet, Torpedo and Bombing class 105.62 m.p.h. and Major Lutz as victor of the fighting plane group.

Ranking next in speed to the single seaters were the Vought Corsair fleet spotters. Lieut. Comdr. Harrill was fourth in the order of finish and Lieut. Comdr. Ralph Davison, of the Navy Department, was fifth, with a speed of 145.43 m.p.h. Both planes had just emerged from the factory and their engines had had only two and a half hours in the air before entering the race. Neither pilot ran at full throttle for the entire distance although at times they were thrown wide open.

Lieutenant Grow, with a Packard-engined amphibian, was sixth; Lieut. Comdr. George Chapline, Bureau of Aeronautics, was seventh, at 115.54 m.p.h., and Lieut. De Long Mills of the Naval Air Station, Lakehurst, N. J., was eighth at 115.40 m.p.h. The latter two had Wasp engined Loening Amphibians. The fourth entrant in this class, Lieut. H. C. Busby, U.S.M.C., of Brown Field, Quantico, Va., flying a Liberty-engined Loening Amphibian, left the race on the third lap with engine trouble.

Lieutenant Gallery, in the torpedo and bombing plane class was ninth; Lieut. W. J. Slattery was 10th at 104.47 m.p.h., and Lieut. R. W. D. Woods, 11th at 101.96 m.p.h. Slattery and Woods are from Hampton Roads Air Station.

Schedule Loening Trophy Inter-Collegiate Air Race for June 16 at Mitchel Field

PORTER ADAMS, president of the National Aeronautic Association, has announced that through the courtesy of Assistant Secretary of War Davison the first Inter-Collegiate Air Race for the Loening Trophy will be held at Mitchel Field, L. I., N. Y., on the afternoon of Saturday, June 16.

This Trophy, which was donated by Grover Loening, designer of the amphibian plane which bears his name, is to be competed for annually by college students of the United States. Each college club may enter one team of three pilots but is limited to one plane to be piloted by each member of the team in his proper turn and the first contest will be for speed in attaining one mile of altitude. Planes must cross the starting line in flight at an altitude not greater than 100 ft. and level flight must be maintained for at least one-half mile before crossing the starting line. The Trophy will be awarded to the college flying club represented by the winning pilot or team, and in addition to the Loening Trophy, Mr Loening has offered cash prizes and medals to encourage the development of college flying clubs as follows: 1st Prize—$500, 2nd Prize—$300, 3rd Prize—$200; while in addition $1,000 will be equally divided as an expense bonus for those contestants who qualify.

The judges of the contest include Colonel Lindbergh, C. V. Whitney, Reginald L. Brooks, Henry P. Davison, and Thomas Hitchcock, Jr., while the race itself will be held under the auspices of the Contest Committee of the National Aeronautic Association.

Union Oil Co. Travel Air Plane Now Making Extensive Tour of Oil Marketing Territory

THE LATEST West Coast scout plane to be sent on a tour of the air fields is the Union Oil Co.'s blue and white Travel Air biplane which is now touring western airports piloted by Ted S. Lundgren.

This is the first of a fleet of airplanes to be placed in service by the aviation department of the Union Oil Co., and during its present tour will visit every landing field in the marketing territory served by that organization, extending from Canada to Mexico.

Demonstrates DH "Moth" With Slotted Wings to a Representative of *Aviation*

"JIMMIE" TAYLOR, former Navy pilot and now connected with Air Associates, New York, demonstrated at Curtiss Field, L. I., N. Y., recently to a representative of AVIATION the flying qualities of the DH "Moth" (Cirrus, four cylinder in line 60 to 90 hp. air cooled engine) equipped with Handley-Page automatic slots on the leading edge of the upper wings. This is the Moth recently purchased by Grover C. Loening, airplane engineer and manufacturer of New York, through Air Associates, for his personal use.

With Taylor handling the controls from the rear cockpit, the Moth took off from Curtiss Field in a run of less than 300 ft. over rather rough ground. The bumpy field suggested that a wider landing gear on this plane would be an improvement with American fields in mind.

At 1000 ft. Taylor throttled down his engine and put the Moth into a steep climbing turn. The slots immediately assumed a fully extened position. Taylor held this stalling angle some 30 sec. Nothing happened beyond a vertical settling. A dive to regain flying speed followed. A steep spiral climb was made next and then a rapid spin from which, Taylor explained later, it was extremely easy to recover. A loop, slow turns, etc. concluded the acrobatics.

The Moth is an extremely maneuverable and well constructed little sport plane, but at its price of $6000 in the United States for two seats and 60 hp., it appears to be in a rather exclusive price class, according to expressions heard at the field.

New Five Cylinder Radial Aircraft Engine Being Tested in England in Avro Airplane

TESTS ARE being completed in England on the "Titan", a five cylinder radial engine now installed in an Avro training plane. The engine, produced by the Bristol Aeroplane Co. employs the same cylinders as on the standard Bristol Jupiter nine cylinder 485 hp. engine. The five cylinder Titan develops a maximum of 220 hp. at 1870 r.p.m. It is rated at 200 hp. at 1700 r.p.m. The engine weighs complete with starter gear and hub 500 lb. which is slightly less than the weight of the Wright Whirlwind. The Whirlwind, however, is known to have developed more power. The five cylinders are arranged radially with the valve gear and exhaust ports in front of the cylinders. The bore and stroke is 5.75 in. by 6.25 in. giving a displacement of 812 cu. in. (The displacement of the Whirlwind is 788 cu. in.) At rated speed the engine is said to have a fuel consumption of 12.5 gal. per hr. and an oil consumption of 5 pt. per hr.

With this engine installed the Avro is said to have a top speed of 93-95 m.p.h. At 1,500 r.p.m., which is about cruising speed of the engine, the airspeed was 76.77 m.p.h.

International Aircraft Corp. at Cincinnati Dedicates New Factories and Flying Field

NEW FACTORIES and an auxiliary flying field of the International Aircraft Corp. at Cincinnati, O., recently were officially dedicated with the recognition of the Cincinnati Chamber of Commerce and the American Legion. Clarence D. Chamberlin was an honored guest.

During the afternoon the new plant colony, consisting of four factories and a separate office building, were thrown open to the public, with all departments and all workers on duty. More than 10,000 persons visited the plant during the afternoon, and next day, Sunday, it was estimated that 500 persons were taken for flights.

The International Aircraft Corp., which occupies the buildings formerly used by the Government during the World War as the Ancor nitrate factories, is rapidly getting into heavy production, it is stated, on both the F17 Sportsman plane and the F18 Air Coach. Arthur H. Ewald is president of the concern.

F.A.I. Officially Recognizes 318 m.p.h. Speed Record Made by Major De Bernardi

OFFICIAL NOTICE has been received by the National Aeronautic Association from the Federation Aeronautique Internationale that the maximum speed record made by Maj. Mario de Bernardi, Italian flier, has been homolgated. The record is listed as follows:

Class C-2, Seaplanes

Maximum Speed (Italy)

Maj. Mario de Bernardi, Macchi 52, monoplane, Fiat engine Type AS-3, at Venice, Italy, March 30, 1928. Record—318.624 m.p.h. (512.776 k.p.h.)

Former Record:

Maj. Mario de Bernardi, Macchi M-52, Fiat 51 engine at Lido, Nov. 4, 1927. Record—297.816 m.p.h. (479.290 k.p.h.)

Used Curtiss-Reed Propeller

Word has been received by S. A. Reed, propeller inventor, that this record was established with a Curtiss-Reed forged type metal propeller built by the Curtiss Company at Garden City, L. I., N. Y., and modified in accordance with special designs of Mr. Reed. This adds another record to the string of contest victories achieved with the Curtiss-Reed.

Announce Schedule and Stops for New Albany-Buffalo Mail Line Opening June 1

ANNOUNCEMENT HAS been made that Schenectady, Utica, Syracuse, and Rochester will be stops on the new air mail line opening June 1 for service between Albany and Buffalo, N. Y. The planes, furthermore, will continue to Cleveland, O., where the route will connect with east and westbound transcontinental air mail traffic as well as with the Cleveland-Detroit service. The schedule has been announced as follows:

Westbound: leave Albany 10.09 A.M.; leave Schenectady, 10.24 A.M.; leave Utica, 11.17 A.M.; leave Syracuse, 11.54 A.M.; leave Rochester, 12.54 P.M.; leave Buffalo, 1.55 P.M., arrive Cleveland, O., 4.15 P.M.

Eastbound: leave Cleveland, 12.20 P.M.; leave Buffalo, 2.50 P.M.; leave Rochester, 3.39 P.M.; leave Syracuse, 4.36 P.M.; leave Utica, 5.12 P.M.; leave Schenectady, 6.03 P.M.; arrive Albany, 6.13 P.M.

New Engineering Department Members Announced by Kreider-Reisner Company

SEVERAL ADDITIONS have recently been made to the engineering personnel of the Kreider-Reisner Aircraft Co., Inc., Hagerstown, Md. F. E. Sieler, who was formerly at the Naval Aircraft Factory in Philadelphia, is chief engineer and has been connected with the Kreider-Reisner organization for about a year.

M. B. Moore, who was formerly with the Fairchild Airplane Mfg. Co. of Farmingdale, L. I., and M. A. Mills, formerly of the Naval Aircraft Factory, are the new members in the engineering department. C. E. Shockey, who has had wide experience in production and detailing work in the automotive industry, has also been connected with this department since the first of the year.

French Organization Builds an All Metal Wright Whirlwind Powered Cabin Plane

AN EXTERNALLY braced cabin monoplane powered with a Wright Whirlwind engine and resembling very closely the popular American planes of this type was recently completed by the Societe pour la Construction d'Avions Metalliques (Metal Airplane Construction Co.). The Avimeta A.V.M. 92 G.R. is of all metal construction designed to use a Salmson 120 or 230 hp. engine, Lorraine 200 hp. engine, Armstrong-Siddeley Lynx 200 hp. engine, or the Wright Whirlwind engine.

The engine is mounted some distance in front of the pilot's cockpit in front of the leading edge of the high wing, four seats are provided for the passengers in the cabin under the wing, and the landing gear and wing trussing is of the type common on American commercial type monoplanes. The radius rods are hinged to the lower longerons, while the shock absorber is contained in the compression strut and braced to the upper fuselage longeron. The shock absorber consists of rubber discs in compression. Provision has been made for

The Avimeta A.V.M. 92 built in France by the Societe pour la Construction d'Avions Metalliques

the installation of brakes, though they are not provided as standard equipment. The disposition of loads is almost identical to that in most American planes, even to the location of the 40 gal. tanks, one in each wing. It is claimed that with this fuel load the A.V.M. 92 has an endurance of five hours or an average of 500 mi.

Avimeta planes are all constructed of "Alferium", an aluminum alloy resembling our duralumin. The internal structure is entirely of bent sheet metal members and extruded sections. Corrugated sheet metal is used for the covering of both wings and fuselage; this covering is designed to take part of the load. Front and rear spars are identical, being made up of simple I beams consisting of a solid sheet metal web with extruded angles bolted to it. To the flanges of the I beams, on top and bottom, are riveted flanged U sections with the open part of the U away from the beam and the corrugated covering riveted to the flanges. In addition to these beams there is an additional longitudinal beam between the spars which helps to carry the load from the covering to the main beams. It is riveted to the covering along its entire length and attached to the compression ribs at the ends. These members do not extend across the compression ribs. The fuselage is made up of four longerons, each made up of an angle with a sheet of metal riveted across the corner, making it a closed section. The lateral bulkheads are made up of U sections with angles to reinforce the corners.

With a 129 hp. Salmson engine the high speed is 75 m.p.h., while with a Wright Whirlwind it is 102 m.p.h. With these engines the cruising speeds are 70 m.p.h. and 90 m.p.h. respectively while the landing speeds are 34 m.p.h. and 43.5 m.p.h. The overall span is 41 ft. 3 in., the length 30 ft. 8 in., and the height 9 ft. The wing is rectangular in plan form and employs a moderately thick section. It has a total area, including ailerons, of 312 sq. ft. The ailerons extend the total length of the wing but do not extend quite to the tip as the rounded tip is continued back to the trailing edge.

The weights in pounds of the A.V.M.92 are as follows:

	Salmson 120 hp.		Whirlwind 220 hp. normal		Whirlwind 220 hp. maximum	
Passengers	352		704		1100	
One pilot	176	750	176	1215	176	1786
Gasoline and oil	222		335		510	
Miscellaneous		174		221		221
Power plant		610		718		717
Wings	463		463		463	
Landing gear and struts	132	926	132	926	132	926
Fuselage	287		287		287	
Tail surfaces	44		44		44	
Total weight in lb.		2460		3000		3350

New Hallett Seven Cylinder Radial Engine Performs Well in Plane After Test Run

AFTER APPROXIMATELY 150 hr. of operation on the test stand, the first model of the new seven cylinder radial aircraft engine being produced by the Hallett Manufacturing Co. of Los Angeles was installed in a Thunderbird biplane at the Glendale, Calif., factory and has had over 35 hr. of satisfactory performance in the air. The bearings have not been touched in the entire 185 hr. of running, and no adjustment of any sort was found necessary in the engine after its flight tests, the carburetion being pronounced perfect.

Forgings and castings for the first lot of 100 engines have now been completed, two final assembly stands have been set up, and engines are being completed at the rate of one a day.

Although the standard Hallett radial has a displacement of 526 cu. in., a special model is being built to order for the National Air Races. This engine has a slightly smaller bore giving it a displacement of slightly under 510 cu. in. in order that it may be eligible in that class. Increased r.p.m. gives this special engine at least as much power, it is said, as the standard model.

City Council of Los Angeles Drafts Aerial Ordnance Requiring Licensing of Airplanes

INCORPORATING A clause to the effect that no plane or pilot may fly above any part of Los Angeles city unless properly licensed by the Department of Commerce, a new aerial ordnance is being drafted by the Los Angeles City Council.

The new city ordnance also provides that every aircraft operator within the city must hold a city license and must fly according to aerial traffic rules outlined. Among these traffic rules is one which prohibits all stunting over Los Angeles territory unless by specific permission of the city manager of airports.

Department of Commerce Awards Type Certificate 39 to Berliner OX-5 Airplane

ANNOUNCEMENT HAS been made by C. L. Ofenstein, Department of Commerce aeronautical engineer, that Approved Type Certificate 39 has been awarded to the Berliner OX-5 monoplane, manufactured by the Berliner Aircraft Co., Alexander, W. Va. The Berliner monoplane is a standard three place, open cockpit craft. The plane's wing is of the parasol type.

Last Minute Briefs

Alexander "Tommy" Thompson has incorporated the Thompson Flying Service at Salt Lake City, Utah

Ira Burke has taken the agency for Travel Air planes in half a dozen Kansas counties Burke has a hangar completed at Newton, Kan, his headquarters

Bert Wright, engine mechanic, has taken the agency for Swallow planes for 11 counties in Central Kansas. He now has a hangar under construction at Newton.

The Co-Operative Flying Club has been formed in the western part of Chicago Two Boeing Air Transport Co pilots have been secured to give instructions to members in the club's newly-purchased Travel Air plane

The factory of the American Eagle Corp at Kansas City, Mo, is being enlarged with a 20 by 100 ft building to be used as a wing department. The company's plane production is being increased from eight to 12 planes a week

Fowler Barker, commercial agent with the Government's Detroit Bureau of Foreign and Domestic Commerce, recently was transferred to Washington to become chief of the aircraft section Transportation Division Department of Commerce Barker served as pilot with the British forces during the War

Dr Hugo Junkers has returned to New York after having made a tour which included Philadelphia Washington, and several Middle Western cities The Junkers Corporation head plans to stay in this country several more weeks.

Lee Hurdmen Harris, pioneer airport engineer who has specialized in this class of work since 1916, is now located at Brightwaters L. I He is prepared to handle all phases of airport engineering, he states.

The L. C Armstrong Co., custom body builders, plan to start production on airplane fuselages, wings, and cabins within a short time The company, which is located at 1635 El Centro Ave Hollywood Calif., will be in a position to manufacture these products for Eastern manufacturers

The Daniel Guggenheim Aeronautical Laboratory of the Massachusetts Institute of Technology, Boston, will be formally dedicated on Monday afternoon, June 4

Edward F Schlee, president of the Wayco Oil Co of Detroit, owner and co-pilot with William S. Brock of the Pride of Detroit, has entered a Bellanca monoplane as the first official entry in the 1928 National Air Tour, which begins from Ford Airport June 30 William Brock will pilot the Bellanca

An Army Fokker tri-engined transport monoplane bearing Ray Cooper and three newspaper men has left Detroit on a 6 000 mi pathfinding trip to map the route of the 1928 National Air Tour

The Model 447 C Fairchild Caminez has successfully passed the U S Army Air Corps 54 hr test Passage of this test is a requisite for Air Corps recognition as a standard production engine

The Bourdon Aircraft Corp of Hillsgrove, R. I., has completed its first biplane, the "Kitty Hawk", powered with a seven cylinder Ryan Siemens engine. A tour of New England will shortly be made in the plane

Tests and calibration of a new ground speed indicator have been begun by Dr Adam Hoffman, dean of the Mechanical Engineering Division at the University of Dayton, O W C. Rogers, formerly in the Air Service, invented the device

Capt George White is continuing his experimental flights in his ornithopter at St Augustine, Fla., despite a recent fall from an altitude of five feet which damaged the right wing of his flapping craft

A. V. Thaden, vice president of the Thaden Metal Aircraft Corp of San Francisco, announces that the company is working on a new four place, full cantilever wing, all metal cabin monoplane It is expected that two of the planes will be ready by July 1

W B Allen has become field manager and F I Gigax salesman of the Steele Airlines, Inc., Eaglerock distributor in Western Kansas and Eastern Nebraska

Lieut Clifton C. Hutchinson has been appointed flight manager and general director of the flying school of the Robertson Flying Services, Inc., at Lambert-St. Louis Field. Hutchison, a graduate of the Army Flying School, is a transport pilot.

Lieut Julius Johanpeter has been appointed an instructor of the Robertson Flying Services. Lieutenant Johanpeter is also an Army Flying School graduate

General Nobile has made a flight to the North Polar Lenin Land in his dirigible Italia The Italian explorer, unable to land his airship because of fog, returned to his Spitzbergen base where he is now preparing for a flight to the Pole itself

G M Bellanca is to build a monoplane powered with two Wasp engines placed in tandem, it is reported, for Shirley Short, former mail pilot and Harmon Trophy winner Short, it is understood, will attempt a trans-Pacific flight

Transfer of air mail from the Newark, N J, field, to the New York Post Office will take but 25 min. as compared with the two hour time from Hadley Field, at New Brunswick, which is now used. The Newark field will be operated beginning August 1.

A new aerial camera has been developed by the Fairchild Aerial Camera Corp of New York in collaboration with the Army experimental section at Wright Field, Dayton, O The camera will be described in an early issue of AVIATION

The Aero Coupe, a convertible cabin biplane, recently produced by the Aero Craft Manufacturing Co of Detroit has been flight tested. A complete technical description of the plane will appear in an early issue

Dieudonne Costes and Joseph Lebrix, around the world fliers, have begun a tour of Europe Following their return to Paris, they will prepare for a flight to New York, it is said.

The Weeks Air Craft Corp of Milwaukee, Wis., has taken the agency for the Monocoupe plane. The Monocoupe is made by the Mono-Aircraft, Inc., of Moline, Ill.

G. M. Bellanca Completes Large Hornet Powered Sesquiplane for Cesare Sabelli

GIUSSEPPE M. BELLANCA has designed and completed his largest plane, a sesquiplane powered with a single 500 hp Pratt & Whitney engine. The Model K Bellanca has been completed for Cesare Sabelli, an Italian World War ace, who is contemplating a flight to Rome and return accompanied by Roger Q Williams, pilot, and Pietro Benelli, navigator and radio operator

The plane has many original features including a retractable landing gear, an auxiliary wing or lift strut of nearly six

The Bellanca Model K, long distance type powered with a Pratt & Whitney Hornet engine Photo was taken during preliminary flights at Hadley Field, New Brunswick, N J

foot chord at the root and two foot chord at a point slightly below the upper wing and also a portion of the wing structure of metal covered with sheet duralumin making this part of the wing a gasoline tank. The overall span of the model K is 65 ft., it weighs 4,000 lb empty with tanks, instruments, furniture, etc The gasoline capacity is 1100 gal which should give a range of approximately 5,700 mi The plane was recently tested at Hadley Field, New Brunswick, N. J., by Harry G Smith, test pilot for the Bellanca Aircraft Corp

Word from Baltimore, Md, states that the project has been supported thus far by a group of Italian-Americans. The plane is said to have cost $75,000, and it is stated that the Baltimore Association of Commerce has been asked to raise an additional $15,000 to cover the other expenses of the flight The Mayor and the association of commerce are very much interested in a flight of this kind and a committee has been appointed to investigate the proposition The committee is composed of Harter B Hull, J W Tottle, Richard Mommers, Jacob Blaustein, and David Luke Hopkins. All are prominent Baltimoreans.

A complete description of the Model K Bellanca will appear in an early issue of AVIATION

Keystone Company is Awarded Government Contract for 35 "Panther" Bombing Planes

A CONTRACT for 35 Keystone "Panther" bombing planes costing approximately $1,300,000 in full has been awarded by the U. S Government to the Keystone Aircraft Corp of Bristol Penna., according to an announcement by Edgar N Gott, president This is reported to be one of the largest single contracts awarded an aeronautical firm for the manufacture of government planes. The Panther was one of the five types designed according to Air Corps specifications and submitted by manufacturers to the Government for exhaustive tests at Wright Field, Dayton, O

Approximately half of the engines required for these planes will be 525 hp Wright "Cyclones" The remainder of the engines will be "Hornets" furnished by the Pratt & Whitney Corp of Hartford, Conn. An interesting comparison of these two famous types of air cooled engines in actual service will be afforded The Wright Cyclone recently enabled the PN-12 Navy seaplane to establish a new world's seaplane endurance record of over 36 hr. at Philadelphia

The Keystone Aircraft Corp has contracted to deliver the first Panther by next October, with the full order to be completed and delivered by July 1929

Price of Loening Cabin Amphibian Plane Is Increased from $24,700 to $26,700

AN INCREASE in price of the Loening Cabin Amphibian plane has been announced by the Loening Aeronautical Engineering Corp of New York City. The plane will hereafter sell for $26,700. The former price was $24,700

The Loening Cabin Amphibian is the first plane built by the company for commercial use and is a direct development from the Loening OL-8, the standard service type now in production for the U S Navy The plane is powered with the 425 hp. Wasp engine

A number of Loening Cabin Amphibians are now under construction, according to Beckwith Havens, sales manager of the company The Canadian Trans-Continental Airways Co., Havens asserts, has purchased one of these planes for mail and passenger service to the maritime provinces of the Dominion

REVIEWS

The Book Department Aviation 250 West 57th St New York City can supply all books mentioned except government publications N A C A publications may be obtained upon request from the National Advisory Committee for Aeronautics Washington, D C

A B C of Flight by W. Laurence LePage, published by John Wiley and Sons, Inc., New York City, 141 pages, price $1 50.

This book, with a foreword by the Assistant Secretary of the Navy for Aeronautics, Edward P Warner, presents in clear, simple language the fundamental principles of the airplane and of flight It assumes no previous knowledge of the subject or of any knowledge of mathematics or physics beyond that of every-day observation. Illustrated with a number of photographs and sketches, A B C of Flight should prove an excellent supplement to a ground school course or to the non-technical layman interested in the fundamentals of flying Both the airplane and airplane engine are described and, in addition, there is a chapter devoted to flying instruction It makes no pretense at teaching the reader to fly, but is offered so as to be of material effort to one taking actual flying instruction.

Aircraft Engine Instructor edited by A L Dyke, published by The Goodheart-Willcox Co., Chicago, Ill., 372 pages, price $5 00

In the Aircraft Engine Instructor, Dyke has compiled a wealth of information on the construction, maintenance and operation of aircraft engines and accessories. This hand book, giving the data on the best known aircraft engines, fills a gap in the list of modern aeronautical texts in a most thorough manner It is well illustrated with photographs of the various engines bringing out structural details and methods of adjustment and assembly In addition, there are a number of line sketches, many of which are in colors Each of the modern engines is described in detail, while a complete chapter is devoted to war surplus engines which are now in use Approximately one-third of the book is taken up with accessories, such as magnetos, carburetors, starters, instruments, controls, etc

Many Civic Leaders in the San Francisco Area Boost Citizens' Aviation Association

TWENTY-TWO CIVIC leaders and East Bay aviation enthusiasts have endorsed and accepted membership in the Citizens' Aviation Association, San Francisco, according to Frank W. Epperson of Oakland, president. These include: Guy Turner, E. B. Field, Max Horwinski, Maj. Livingston Irving, William H. Parker, Emil Fritsch, R. S. Austin, F. M. Bohler, W. E. La Follette, Capt. George D. Ream, C. L. Gilbert, Joseph B. Gardner, Henry N. Young, Capt. W. B. Voortmeyer, H. B. Auerbach, Herman C. Ferguson, Phillip M. Fisher, Capt. D. E. Doty, J. F. Long, A. R. Wilde, John L. Burney, J. R. Jahn, L. E. Hausman, R. R. Loland, W. G. Bulloch, H. H. Schuler, Meris J. Cann, C. A. Askin, A. W. Nuching, W. E. Peletier, and O. E. Lundstrom. The prime object of the organization is to promote public interest in aviation, and to encourage private enterprise in that line.

David Bell Company Issues a New Catalog Of Its Automatic Screw Machine Products

DAVID BELL Co., Inc., of Buffalo, N. Y., recently issued a new catalog of its automatic screw machine products. Part of this catalog is devoted to the aircraft products manufactured by the company, which include propeller hub pullers, valve puller parts and assembly, aileron hinge eye bolts, clevis pins, strut assembly parts, and special bolts of all descriptions.

Bell products are made from cold-drawn or hot rolled special screw stock, from alloy or special steels, or from other similar materials. They can be heat treated, rust-proofed, or plated.

New Tri-State Airlines, Inc., at Sioux City is Ryan and American Eagle Dealer

TRI-STATE AIRLINES, Inc., has been organized to operate at Sioux City, Ia., at the Rickenbacker Airport. One hangar is already built at the field and another will shortly be constructed.

The company, which is American Eagle and Ryan plane distributor, will use the former type planes for instruction in the flying school scheduled to open June 1 and a Ryan plane for general transportation and taxi work. Royal Miller, president of the concern, and James Barwick, vice president and chief pilot, are going to San Diego, Calif., to bring back the Ryan plane ordered. Frank Mulhall is business manager of the company, while Dale Jones is secretary and treasurer.

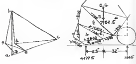
Fuselage Analysis

Continued from page 1525

ticular item a little judgment is all that is needed. For regularly shaped tanks and such things the center is taken, for pilot and passengers somewhere about the stomach is a good location, for wings 40 per cent. of the chord back of the leading edge, propellers have their center of gravity right on the thrust line and about in the center of the hub. Engine manufacturers usually specify the location on their blueprints of the engine; the fuselage location depends upon the shape and type but as a general rule it is well to remember that the fuselage structure is much heavier up forward where most of the weights are. When there is some doubt as to the exact location of the center of gravity of an item and one guess is as good as another, select the most convenient location as it will simplify later work. For instance, in locating the center of gravity of the tail group place it at the tail-post if no better location for it is known. This will simplify the work in making up the panel load table which is the next thing to be done.

Distribution of Panel Loads.

In the analysis of the four remaining major conditions, namely, high and low incidence, level landing and three-point landing, it is necessary that all the weights of the plane be applied at the panel points. These panel points are designated by encircled numbers in Fig 75. The weights are split

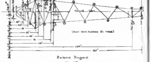


Nosing Over
Fig 74.

up among the panel points which surround the particular weight. For example, referring to Fig 75, the passenger weight of 330 lb. lies between panel points 5, 6, and 7. It must therefore be distributed among these points.

In splitting up weights between panel points it is essential that the moments of all loads at the panel points about the reference line be the same as the original moments of the weights themselves. If this is not the case that means the center of gravity of the plane has moved and in the analysis of the four remaining conditions the polygons will not close and we will have no check on our work. It therefore pays to take great pains in determining our panel loads.

A table of panel loads has been made up for our plane in accordance with the balance diagram of Fig 75. The first



Balance Diagram
Fig 75

step in making up such a table is to list all the panel points and give the horizontal and vertical arm of each point relative to the datum lines. These arms are to be measured very carefully off a line diagram of the fuselage drawn to scale. The next step is to list the balance table as it was given in Chapter 10. This has been done in the first six columns of our panel load table. We are now ready to compute the panel loads.

The propeller and the engine are out forward of any of our panel points and consequently can not be distributed between them. These weights may be placed at panel points 1U and 1L with a horizontal couple at these points sufficient to balance the moment of these weights times their distance

PANEL POINT LOADS

Item	Weight	Vert Arm	Vert Moment	Horiz. Arm	Horiz Moment
Propeller	68	0	0	−3	−165
Engine	360	0	0	6	2880
Oil and Tank	45	−10	−450	32	1440
Power Plant Equipment	50	16	800	42	2100
Pilot	165	0	0	65	10 725
Chassis	156	−30	−4680	50	7800
Gas and Tanks	330	32	10 560	80	26 400
Wings	355	32	11 360	80	28,400
Fuselage	233	−3	−699	88	21,120
Passengers	330	−7	−2310	102	33 660
Baggage	100	−21	−2100	102	10 200
Tail Skid	10	−15	−150	288	2880
Tail Surfaces	50	12	600	317	15,850
Totals	2210		+13 000		163 430

Panel Point	1U	1L	2U	2L	3	4	5	6	7	8	9	10	11	12	13U	13L	14U	14L	a	b
Vert. Arm.	+10	−10	+18	−12	−30	+30	−30	+30	−27	+24	−21	+18	−18	+11	+6	−15	+6	−12	6	6
Hor Arm	15	15	36	36	47.5	58	80	101.5	128	148.5	176	198	228	250	287	287	317	317	−3	6
Propeller																			68	
Engine																				360
Oil and Tank		8.4	11	25.6																
Power Plant Equipment			27		20	3														
Pilot					17.5	82.5	65													
Chassis					80		56													
Gas and Tanks						147		183												
Wings						178		178												
Fuselage	15	15	20	20	25	25	20	20												
Passengers							118	110	10	10	8	6	8	6	5	5	5	4		
Baggage							48	10	202											
Tail Skid									42											
Tail Surfaces																6.7	50			
Totals	15	23.4	68	45.6	142.5	456.5	301	470	154	10	5	6	5	6	5	14.7	55	4.3	68	360
Horiz Mom of Panel Loads	225	351	2093	1684	6796	27 000	24 040	48 520	19 720	1485	880	1176	1145	1251	1435	4227	17 410	1362	−195	2880

Sum of Panel Loads = 2210 lb = Total Weight

Sum of Panel Load Moments = 163 448 in lb

forward at panel station 1. We prefer to handle them in another way however. For the present their location will be considered a panel point and they will be called a and b as is done in the table. Later in the individual analysis dotted lines will be drawn from panel points a and b 1U and 1L and the stresses due to these overhanging weights carried along the dotted lines to the fuselage structure proper. This will save a lot of arithmetic and will give the true loads due to these weights a and b.

The oil tank lies between four panel points. This is a common case on many airplanes that use the Pratt truss for the fuselage. In this case the load is first distributed horizontally between stations 1 and 2. The load is distributed inversely as its distance from the stations. Then the load should be distributed vertically between the upper and lower panel points of each station. It so happens that panel point 1L is on the same level as the oil tank and therefore the whole load of 8.4 lb that reaches station 1 stays right there. The remainder of the load of 36.6 lb which reaches station 2 is broken up and distributed inversely as its distance from panel points 2U and 2L.

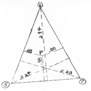
It is particularly important, as mentioned before, to keep the moments of the panel loads the same as those of the original weights. This applies especially to the horizontal moments but it is not so necessary to be as careful of the vertical moments. In items such as wings, gas and tanks, chassis, tail skid, and tail group which come just above or below the longeron, we may consider them on the longeron. Thus they are merely distributed between the panel points on either side inversely as their distance away. The error we are making here in the vertical moments is not as great as it seems as moving the chassis up to the lower longeron compensates for moving the loads above the upper longeron down to that level. Our center of gravity as a result moves very little if at all. It is to be noted how easily the tail group was placed at a panel point. If we had placed the center of gravity behind the tail post we would have had to add a panel point c and handled it in the same manner as panel points a and b for the propeller and engine. If we had taken the center of gravity forward of the tail post the tail weight of 50 lb could have been brought down to the upper longeron and distributed between panel points 13U and 14U.

The distribution of the fuselage weight itself among panel points is probably the most difficult to handle. The only method available for doing this is to arbitrarily break the fuselage weight up into small weights and apply one at each panel point putting the larger weights in the region of the cabin. The structure in this region will be much heavier than in the rear and usually the fuselage weight includes flooring furnishings etc. which are located in the cabin. After distributing these loads at the panel points their moment must be taken about the datum line. The sum of all these moments must very nearly equal the total fuselage moment. Usually this will not be the case on the first attempt and the loads must be shifted slightly. Originally in making out the panel load table the fuselage panel loads due to the fuselage weight itself were all five pounds from station 9 back. This gave a moment of 21,243 in. lb for all the panel loads as against an original fuselage moment of 21,120 in. lb. This was too great a difference. By moving one pound from panel point 14L to panel point 10 the moment of the panel loads became 21,122 in. lb which is very close to the original moment. This distribution is therefore satisfactory.

The items which we have not as yet accounted for are located between three panel points. Their distribution among the surrounding panel points must be handled quite differently. The method is illustrated in Fig. 76.

For illustration we have taken the passenger weight of 330 lb designated in the figure by point P. Point P in the figure

is located accurately with respect to the surrounding panel loads. Fig. 76 is merely one little section taken from Fig. 75 and reconstructed very accurately. Perpendicular lines are dropped from Point P to each of the three sides and from each panel point to the opposite side. To obtain the



Triangular Distribution of Panel Loads.

Fig. 76.

proportion of the 330 lb. on each panel point the following method is used:

Panel Point (5) 330 × .80/2.24 = 118 lb.
Panel Point (6) 330 × .96/2.94 = 110 lb.
Panel Point (7) 330 × .68/2.20 = 102 lb.
Total = 330 lb.

If a check is made it will be found that each of these panel loads times its arm when summed up will equal the original moment of the 330 lb. weight times its arm of 102 in. It is to be noted in computing any particular panel load we use the line dropped from it to the opposite side and the line from P parallel to this line. The power plant equipment, pilot, and baggage distribution had to be figured in the same way for the panel load table. With a Warren truss fuselage structure this method will always have to be used for items falling within the triangles. The measurements marked on the figure are in inches as the figure was originally drawn. It is likely that it will be reduced in publishing but all the dimensions will bear the same relation they now do.

Summation of Panel Loads.

When the table of panel loads has been completed it is advisable to total them as has been done at the bottom of the table. This will locate any errors that may have been made. The horizontal moment of each panel load must also be found and the sum of all of them found. If this is fairly close to the original moment we will not have much trouble in making our stress polygons close. If the difference in the two moments is more than 200 in. lb. it is very likely that a mistake has been made somewhere and the work should be checked back. It is worth while spending a great deal of time getting the panel loads distributed correctly as it greatly facilitates later work.

It is to be remembered that these panel loads are for a unit weight and do not contain any load factor as yet. In the next chapter the four remaining major conditions will be analyzed and the fuselage members designed.

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To be continued in the next issue of AVIATION

N.A.C.A. Progress

Continued from page 1523

also as to what form of cowling and fuselage shape allow of the best cooling of the engine.

The tunnel is of the open throat type, but the stream of air flowing through the room in which the observers stand is very sharply defined, so that the air on the floor is practically stationary, while almost within reach of one's hand it is blowing at over 100 m.p.h. When the tunnel is in operation and the plane's engine is running, the noise is deafening and orders are given by a system of signals. When the tunnel was first built, not enough allowance had been made for the low pressure in the inner room, and the walls nearly caved in, but since then they have been reinforced.

Pressure Run Up to 300 Lb. Per Sq. In.

To the aeronautical engineer, the variable pressure wind tunnel is one of the most interesting things at Langley. In tunnels where ordinary atmospheric pressure is used, a correction must be made for the scale effect. In other words, the full sized airplane does not have a performance which can be directly calculated from data gathered from the small models, but certain corrections must be made, and these are to a certain extent a matter of estimate. By increasing the

The ... bladed propeller mounted in the N.A.C.A. 20 ft wind tunnel.

pressure of the air and therefore its density, it is thought that small scale models will give the same results as those obtained in full sized airplanes. So far there is reason to believe that the variable density tunnel will enable engineers to calculate actual performance from small models considerably more accurately than can be done at present. Pressures

in the tunnel run up to 300 lb. per sq. in. and the technical difficulties of designing and operating the tunnel are very considerable. Last year the tunnel caught fire and the inside was completely burned out before the pressure could be reduced. In fact, the heat caused the pressure to be increased and a real disaster was narrowly averted

In the same building as the variable density tunnel are two extremes in the study of objects in a moving fluid. One is a water tank with glass sides. The water is circulated comparatively slowly and coloring matter is introduced This enables one to see the flow about any object which is introduced. As the density of the water is very much greater than that of air, it can be circulated very slowly and yet produce the same phenomena of turbulence, etc, as are produced by a very high speed air flow This method of testing is inexpensive and enables the student to visualize the disturbance caused by an obstruction. The other apparatus is a jet of air which is forced through a small tunnel at velocities above those of sound At present, only propeller tips even approach such velocities, but there is an undeveloped speculative field here which has interesting possibilities

Experimenting With a Variable Stroke Engine

The engine division of the N.A.C.A. is conducting a series of experiments with a variable stroke engine This enables the compression to be changed while the engine is in operation, and much can be found out about the anti-detonating qualities of various fuels. Work is also being done on heavy oil engines. In order to do this, a most ingenious device has been developed to photograph the diffusion of the fuel oils which is injected into the cylinders.

During the past year, tests have been run to determine the pressure on the bottom of seaplane floats on landing These show that the maximum pressures occur at the step where seven pounds to the square inch were registered. These were in pancacke landings and the accelerometer showed that the impact was about six times that of the weight of the plane.

The full scale experimentation on increasing the stalling angle by sucking or pumping air in the area behind the leading edge on the upper surface of the wing has not been pushed forward vigorously, as the results obtained were not at all promising.

Some interesting data on the formation of ice on planes has been gathered and many flights were made through clouds where ice forming conditions occurred. It is hoped to build a small tunnel which can be refrigerated for further study of this subject.

One of the most interesting pieces of work which the flight testing section has been doing is the recording of the pressure on the wings and control surface of a pursuit plane during violent maneuvers. Tubes are run to all parts of the planes and variations of pressure are transmitted to recording instruments from which pressure distribution charts are made. This work is of course of enormous value from the structural standpoint to the designers of pursuit planes. Certain parts of the wing showed lift of 500 lb per square foot. The most spectacular work of the section was the tests conducted by Luke Christopher to find the maximum strains which could be placed on a plane A Curtiss Pursuit pulled out sharply from a dive at 190 m p h showed stresses of over eleven times those found in normal flight At the time of pulling out of the dive, the forces acting on the pilot were so great as to cause hemorrhages in the eyes and serious internal derangements

At present the flight section is testing a Consolidated training plane which is fitted with Handley Page slots. Many of

the visiting engineers flew in the plane and were greatly interested Comments were varied, but it was generally conceded that the plane was more stable beyond the stalling angle and somewhat more controllable. During the tests Harold Pitcairn went up in his Mailwing and flew alongside of the Consolidated Both planes were stalled and, as far as an observer on the ground could see, they both settled at about the same speed and both kept on an even keel. The two planes are too different to supply a real comparison, and it is conceded the Mailwing has unusual lateral control

Wind Tunnel Studies of Ailerons

Speaking of safety devices, the N.A.C.A. has also been making some very interesting wind tunnel studies of ailerons of normal type, of the Frese type, and of ailerons combined with Handley-Page slots. They have also developed a wing section with an extremely flat top to the lift curve From about twelve to over twenty degrees of incidence the lift stays about the same This means that in flight a plane would not stall suddenly, and also when landing it would have much less tendency to "float" for long distances, because it would settle long before the ultimate stalling point

The above are only a few of the more important points of the work being done by the N.A.C.A. The field of their activity is very wide, but the demonstration of it to the visitors was very well handled. At the beginning of the conference, each department head explained briefly what he was doing Then the visitors were split up into parties and visited the various laboratories. Everything was well labelled and charts explained what had been accomplished After everything had been seen and explained, a general discussion was held and suggestions were requested as to what development work should be undertaken during the course of the next year. Secretary Warner struck the keynote when he said that the efforts of the N.A.C.A. should be turned towards solving those problems which are retarding the commercial progress of aviation Research, he said, could properly be done in silencing planes in improving ventilation in cabin planes, and in arranging more comfortable chairs.

The meeting was not only instructive but was also a very pleasant and well handled occasion and many felt that it could well have been extended over another day.

Rules of the 1928 National Air Tour

Continued from page 1522

cept for the difference in gasoline and oil consumed during the flight

(d)—No contestant will be allowed to carry passengers in excess of the original designed seating arrangements of the plane as referred to in sections 24-H and 62-I of the Air Commerce Regulations.

(10) (a)—The Contest Committee will require each plane to qualify by flying four times over a measured course of approximately one mile, twice in each direction to establish maximum speed to be used in the formula.

(b)—These speed trials will be held, at the option of the Committee, at any time during, before or after the stick and unstick tests. After the beginning of any of the tests no change will be permitted in the propeller setting of a plane until after all tests have been completed.

(c)—In order to discourage racing and its attendant dangers, the maximum speed will be used in the formula, unless the average speed for an individual lap shall fall below 80 per cent of the maximum credited speed. In such an event

the actual miles per hour will be used in the formula to determine the figure of merit.

Formula

$$\frac{\text{Max. D. of C. Useful Load} \times \text{Max. Speed}}{\text{Stick} + \text{Unstick}} \times \frac{50}{\text{Disp.}} = \text{Merit}$$

Example:

Plane has a useful load rating of 1200 lb and shows a maximum speed of 125 m.p.h. 75 per cent. of 1200 lb. is 900 lb. 80 per cent. of 125 m.p.h. is 100 m.p.h. Thus, if the plane carries 900 lb. and the lap speed is 100 m.p.h. or better, the formula would read:

$$\frac{1200 \times 125}{\text{Stick} + \text{Unstick}} \times \frac{50}{\text{Displacement}} = \text{Points}$$

If, however, a plane shall arrive at a control with less than 75 per cent of the maximum useful load permitted by the Department of Commerce, exclusive of gasoline and oil consumed, or if the actual speed for a lap should fall below 80 per cent. of the actual maximum credited speed, the formula would read thus:

$$\frac{\text{Actual load} \times \text{Actual speed}}{\text{Stick} + \text{Unstick}} \times \frac{50}{\text{Disp.}} = \text{Points}$$

(11) The winner of the 1928 National Air Tour shall be declared to be the contestant who has the highest number of points at the completion of the Tour. For the purpose of determining this, the points of each lap of the Tour shall be figured separately and the totals added to obtain the aggregate. In no case shall a contestant be declared the winner of the Tour unless he shall have completed every leg thereof and arrived at the point of starting by sundown of the last day.

(12) In the event of a tie under the previous formula, the winner at the end of the Tour shall be declared to be the contestant who has the highest number of points under the following formula

$$\frac{\text{Contest load} \times \text{Speed}}{\text{Engine Displacement}} = \text{Points}$$

Second position shall be awarded to the contestant having the second highest number of points under the formula used for determining the winner and the third shall have the third highest number of points and so on down until all surviving contestants are accounted for

Entrants, Contestants and Entries

(13) For the purpose of these rules the Entrants shall be defined as the manufacturer or owner of the plane. The Contestant shall be defined as the Pilot named by the Entrant to fly the plane and direct its activities An Entry shall be defined as a combination of plane and pilot.

(14) Subject to the conditions of these rules any manufacturer shall be eligible to compete but no manufacturer shall be permitted to enter more than three planes in the Tour Any plane manufactured by an entrant, up to the limit of entries permitted, shall be eligible to compete whether or not at the time of entry it is the property of a manufacturer or of any individual, except that it may not be the property of the United States Government or of any other government. The entrants, however, shall at all times be responsible for the acts and conduct of each entry

(15) An entrant desiring to offer a plane for competition shall fill out the Official Entry Blank in detail and forward to the Tour Manager accompanied by a check drawn to "National Air Tour", in the amount of $100 In the event that the Entrant shall actually start the contest and shall cross the starting line at the time indicated or within two hours thereafter the entry fee so deposited shall be returned. In the event of failure to so start, however, said entry fee shall be forfeited and shall become the property of the "National Air Tour."

(16) Midnight of Saturday, June 16, 1928, shall be designated as the closing date for entries and any entries not received by the management before that time or which shall not bear postmark prior to that time, shall not be received or accepted, except as hereinafter provided. Under no circumstances will post entries be accepted nor will any application for entry be considered unless it shall have been presented to the Tour Manager not later than 9 A.M., on Wednesday, June 27, and under those circumstances, will be considered as a delayed entry. Delayed entries may be submitted to the Tour Manager after the official closing date, but in that event the entrant shall forfeit all claims to the entry fee of $100 and shall, in addition thereto, be required to get the written consent from all entrants whose applications have been filed prior to the official closing date.

(17) Any entrant may at any time prior to the start of the Contest or during the Contest substitute a pilot for the one named in the entry blank providing such substituted pilot shall have complied with the regulations of the Department of Commerce and such other regulations as may hereinafter appear and also provided the consent of the referee for such substitution is obtained A contestant may not substitute another plane for the one named in the entry blank unless it can be shown to the satisfaction of the referee that the plane named has been damaged in such a manner and in such a way as to make it unairworthy In no event may a second plane be substituted for the one named in the entry blank after the start of the Contest from Dearborn.

Official Starting Time.

(18) Entries shall be numbered in the order of the receipt of the entry blanks by the Tour Manager and the first entry received by the manager shall be given the right of way on the day of the start from Dearborn and shall be the first plane to take off Entry No 2 will take off second and so on down the line until all entries have been accounted for Saturday, June 31, 1928, shall be the starting date and the first plane shall take off at ten o'clock in the morning of that day

(19) Contestants will be given starting signal in the order of their departure and at one-minute intervals after the time designated for the departure of the first plane. This method shall govern the start at each control throughout the entire Tour No contestant shall start before receiving the signal from the official starter and any contestant so doing will be disqualified.

Rotation of Planes After Starting

(20) After the official start at Dearborn the sequence of starting shall be determined inversely by the time of arrival at the last night control station. In this manner the last plane to be checked in at a night control station shall be the first to depart on the next leg of the Tour The second plane out shall be the one which arrived next to the last and in that manner until all planes have taken off with the plane which shall have arrived first at the said night control station being the last to depart. Where noon control stations are established the order of departure from these shall be in the order of arrival, first in, first out. The above method of start shall apply to all control stations except the last control station out of Detroit on the last day of the Tour. On this occasion the first plane to depart from the control station shall be the plane which shall have the highest total number of points at the close of the previous day. The second plane to take off shall have the second highest number of points and so on until each plane is accounted for.

(21) Fifteen minutes before the official starting time the official starter shall raise a red flag which shall be the signal for all pilots to start their engines and, where practical, taxi their planes to the proper positions for the official start. Taxiing about the field other than for the purpose of getting into proper position in the starting line shall not be permitted.

(22) One minute before the starting time of the first plane, the official starter shall raise a white flag which shall be dropped at the proper time to indicate get-away of the first plane. Other contestants will be given a starting signal at one-minute intervals thereafter and this shall be designated in each case by the dropping of the white flag.

(23) Should a contestant be unable to start at the time the signal is given he shall be permitted to depart at any time thereafter but the departing time shall be figured from the time of the signal and not from the time of actual departure. In this event he shall not interfere with the starting of any other plane but shall await the starter's signal that no confict may result. This signal may be given by the starter at any favorable time and need not be delayed until after the departure of the last remaining contestant.

(24) Pilots will at all times conform to the Air Traffic rules laid down by the Director of Aeronautics, Department of Commerce.

(25) Each pilot arriving at a control station shall be alert for other planes which may be in the act of landing or arriving and upon landing each pilot shall taxi from the landing area immediately and proceed to his proper position in the line as indicated by the checker.

(26) Each contestant shall be scored on a basis of elapsed time which shall be taken from the starting signal at the previous control and completed when the contestant shall cross the finish line at the next control in full flight. The actual landing time at each control shall not be considered as it may be determined by each pilot for himself and must be so timed as to prevent accidents as a result thereof.

(27) Each pilot will carry an official log which will be provided by the Tour officials. Prior to the start from Dearborn, this log must be filled out and contain all information regarding the entry together with a record of passengers and weight of ballast and baggage carried. At each control station this log must be turned over to the checker who will enter thereon the record of his checkup and note thereon any discrepancy he may discover. Immediately thereafter the pilot shall turn the log over to the official scorer who will retain it until after the day's score is completed. It will then be returned to the pilot who must present it to his checker before departure on the following day. The checker will then either O.K. the log or make a notation of any discrepancies he may have discovered at this time and it shall be the duty of the pilot to see that this is done. In the event of failure on the part of the pilot to obtain his official O.K. or notation, the pilot will at the next control, at the discretion of the referee, be penalized not less than fifty points but in no case in excess of the total number of points for the leg on which such penalty occurred.

Deferred Start

(28) The start of the first and subsequent planes from any of the several controls may be deferred only at the discretion of the referee and only in the event of inclement weather or other questionable conditions. If it appears that there is any reason for delaying the start, the referee shall consult with the pilots and if no protest is received, the start shall not be deferred. The starting time for the first plane from each control shall be in accord with the 1928 Tour Schedule as laid down by the officials in charge.

Eligibility of Pilots

(29) Any recognized pilot shall be eligible to compete in

the 1928 National Air Tour, provided he can show evidence of having complied with the requirements of the Aeronautical Division of the United States Department of Commerce and shall in addition thereto, hold an F.A.I. certificate and the annual sporting license issued by the Contest Committee of the National Aeronautic Association. Any pilot may, however, be relieved from duty or suspended by an official representative of the United States Department of Commerce or by the referee for physical inability. Such suspension by the referee, however, shall not be made without consultation with a reputable physician and upon the advice of such physician.

(30) Any pilot may be required to undergo a physical examination within 48 hr. prior to the start of the Contest or at any time thereafter at the discretion of the referee. No pilot shall be permitted to compete who is not, in the opinion of the examining physician, in physical condition to do so without injury to himself or other contestants. Contestants shall conduct themselves in an orderly and gentlemanly manner throughout the entire Tour and for failure to conform to the accepted rules of this Contest or for conduct detrimental to the Tour or to commercial aviation generally, may be, at the discretion of the referee, fined in a sum not to exceed $25 for each infraction. Since the entrant is responsible for the action of the contestant, this fine may be deducted from prize money or guarantee money at the conclusion of the Tour.

(31) Rules of conduct applying to contestants shall also apply to officials and guests and any official conducting himself in a manner which, in the opinion of the officials or a majority thereof, shall be detrimental to the Tour, shall be dropped therefrom and the contestant carrying such official or guest shall not proceed further with him but shall replace such offender with another passenger or with ballast as required.

Preparations and Tests Prior to Start

(32) All entries, consisting of planes and pilots, shall be required to be at the Ford Airport at Dearborn, Michigan, not later than 9 A.M., on Wednesday, June 27. This is to permit checkers to weigh up planes and complete the work of loading and sealing ballast, tools and spare parts in place in preparation for the stick and unstick tests which will be held Thursday, June 28. No flying will be permitted on June 27 which will conflict with the weighing or loading of planes.

(33) Beginning at 9 A.M. on Thursday, June 28, the stick and unstick tests will be held. At this hour, each plane will line up in the order of entry, complete with full contest load. During the stick and unstick tests and the maximum speed tests, all fuel tanks must be filled to capacity and all oil tanks must be filled excepting for reserve air space which may not exceed 25 per cent. of the total capacity of the tanks. In addition to fuel and oil, each plane in the stick, unstick and maximum speed tests must carry full useful load permitted by the Department of Commerce of the United States as specified in the approved type certificate awarded the plane. In addition to the gasoline and oil, this load may, for the purposes of these tests, be in the form of passengers or ballast as the pilot may elect.

After the stick, unstick and maximum speed tests have been completed, a contestant will be allowed to reduce his useful load to 75 per cent. of the maximum permitted by the Department of Commerce and specified in the approved type certificate awarded the plane. No contestant shall be allowed to carry gasoline except in tanks regularly provided for such purpose and which shall have been used for such purpose during the stick, unstick and maximum speed tests.

(35) At 9 A.M. on Thursday, June 28, the first plane shall take off from a standing start for the unstick tests. The planes will be divided in groups of three each for these tests so that at no time will there be more than three planes in the air at the same time. Three timers will check the number of seconds required to unstick the plane from its standing start until the wheels are off for the last time. In the event of a discrepancy between the timers, the average time shall be taken as the official time.

(36) The second and third plane of each group will take off at signals in the unstick tests and each pilot will circle the field in the direction indicated to him the morning of the start and each will watch for his number to be displayed on the roof of the small hangar as an indication that he has the right of way to land for his stick test.

(37) Immediately upon receiving signal to land for the stick test, the pilot will comply The timers will then check the number of seconds required to bring the plane to a dead stop after the wheels touch the ground for the first time. Each pilot is warned to maintain a straight roll on landing and not to kick the plane around on the ground as in a ground loop Each pilot is expected to make a normal landing with the minimum risk to structure The referee must be satisfied in this respect.

(38) Any contestant so desiring may have two trials at the stick and unstick tests and the best showing in either case will be accepted as the official time In no case shall the second test be given until after the last plane has finished the first test. If a second test is desired, the pilot will, upon landing, taxi his plane to the proper designated place in the line and will take off on the second test on signal and in proper rotation. In conducting the stick and unstick tests, it is essential that they be completed within the shortest possible time that the results may be comparative. Each contestant is required, therefore, to be on hand and ready at the time the first plane takes off for the test

Multi-Engined Planes.

(39) An entrant of a multi-engined plane will be allowed a lower cubic inch displacement figure than that which actually exists and that used in the formula providing he can demonstrate to the satisfaction of the Contest Committee that his plane is capable of performing as follows

(a)—It will be required that the pilot of a three-engined plane climb from 1000 ft. altitude to 2000 ft. altitude as indicated on a calibrated altimeter carried by the Contest Committee observer as follows With the center engine dead, he shall climb from 1000 ft. to 1400 ft., with the right engine dead he shall climb from 1400 ft. to 1700 ft. and with the left engine dead he shall climb from 1700 ft. to 2000 ft level. If he shall accomplish this to the satisfaction of the Contest Committee observer, he will then be allowed a cubic displacement figure of two thirds of the actual cubic displacement of all engines.

(b)—Where a twin-engined plane is employed, the pilot must climb from 1000 ft. to 1300 ft. with one engine dead and from 1300 ft. to 1600 ft. with the other engine dead. If successful, he will be allowed a cubic displacement figure of one-half of the actual cubic displacement of the two engines. In the event of failure to do this in either case to the satisfaction of the Contest Committee Observer, the total cubic inch displacement of all engines will be taken as the displacement figure in the formula.

Trophies and Prizes.

(40) In addition to the Edsel B. Ford Reliability Trophy, which shall be awarded under the provisions of the deed of

gift to the winner of this Contest, there shall also be the following cash awards

To the plane making the best showing and obtaining the highest aggregate number of points under these rules, $2,500

To the plane obtaining the second highest number of points, $2,000

To the plane obtaining the third highest number of points, $1,750

To the plane obtaining the fourth highest number of points, $1,500

To the plane obtaining the fifth highest number of points, $1,250

To the plane obtaining the sixth highest number of points, $1,000

To the plane obtaining the seventh highest number of points, $750

To the plane obtaining the eighth highest number of points, $650

To the plane obtaining the ninth highest number of points, $400

To the plane obtaining the tenth highest number of points, $300 Each competing plane finishing the Tour on the final day and not placing among the first 10 will be given a bonus of $200

Protests and Appeals

(41) No protests shall be considered unless presented in writing to the Contest Committee of the N A A., within 24 hr after the finish of the Tour and accompanied by a protest fee in the amount of $100 All protests must be in accord with F A I. rules Nos. 78, 79, 80, 81, 82, 83, and 85 In the event that the protest is sustained by the Contest Committee, protest fee will be returned, otherwise it will be forfeited and no farther claims may be made.

Officials General Tour Manager.

(42) There shall be a general manager of the Tour who shall be employed by the Detroit Board of Commerce under the auspices of which organization the Tour is promoted. He shall work under the direction of the Aircraft Events Committee of the Detroit Board of Commerce and shall be charged with details of business or financial arrangements prior to the start and during the Tour and shall, subject to the approval of this committee, employ such persons and methods as may seem necessary for the proper conduct of the Contest.

Referee

(43) A referee shall also be appointed by the Aircraft Events Committee of the Detroit Board of Commerce who shall, for the purpose of the actual contest, be in complete charge and his decision shall be final except as it may be modified by the Contest Committtee of the N.A.A. on protest. The referee shall be charged with the interpretation and administration of the rules of the contest and, from that standpoint, shall be in actual charge of the Contest from the time the planes are delivered to the starter for the stick and unstick tests until the completion of the Tour Since the referee is charged with the interpretation and administration of the rules of the contest, he shall be required to pass upon any disputed points and to settle all questions raised by contestants or officials as soon thereafter as is practical and in no case later than midnight of the day preceding the departure of the Tour on the next succeeding leg of its route.

Official Starter

(44) An official starter shall also be named by the Aircraft Events Committee of the Detroit Board of Commerce and it shall be his duty to see that contestants are started in the proper order and at the designated time from each control

throughout the Tour. The official starter shall also be an assistant referee and, in the absence of the referee, may officiate. Decisions made, however, by the assistant referee, are subject to revision by the referee at his discretion providing such revision is made within six hours after the decision of the assistant referee has been brought to his attention. The starter shall be allowed to choose such assistant as are necessary at each control, and it will be the duty of these assistants to line up the planes in proper order for the start and to deliver them to him in such position.

Scorer

(45) An official scorer shall also be appointed by the Aircraft Events Committee of the Detroit Board of Commerce whose duty it will be to record the time of arrival of each contestant at each control and to compute and announce the result after having checked the pilot's log and record. He shall be permitted to obtain such assistance as may be necessary at each control point and may at his discretion appoint an assistant scorer who shall travel throughout the Tour and assist in computing the scores.

Timers.

(46) There shall be a chief timer, appointed by the Contest Committee of the N.A.A. who shall select two assistant timers. It shall be the duty of these timers to check the time during the stick, nostick and maximum speed tests prior to the start of the contest. After the start of the Tour from Dearborn, the Starter shall be charged with timing the planes out of each control and the Official Scorer shall be charged with timing them in at the next control.

(47) For the purpose of administering Section 9 of these rules, the Contest Committee therein specified shall consist of the referee, official starter and the chief timer.

Payment of Prize Money and Awarding of Prizes.

(48) All trophies and prize money shall be delivered to winning entrants, except upon written authority of such entrants designating some other person. No trophy shall be awarded or prize money paid until after 24 hr. has elapsed after the conclusion of the contest, except that a protest waiver be signed by all contestants whereupon the prizes may be awarded and the prize money paid at the dinner which will follow the conclusion of the contest.

Conflict With Laws.

(50) Should it be found that any rule or any portion of any rule hereinbefore set forth is in conflict with laws of the United States or of the ruling of the Aeronautical Division of the Department of Commerce of the United States, that that rule or that portion of a rule in such conflict shall be null and void and the laws of the United States or the regulation of the Department of Commerce shall be in effect and shall be followed.

The Detroit Air-Olympics

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committee. Charles T. Bush is vice chairman of the same committee.

In staging the 1928 Gordon Bennett race here Detroit is holding the event for the second consecutive year, the first time in the history of the classic it has been held in the same city for two successive years. Should America win the race again this year the Bennett trophy, most prized award of lighter-than-air competition, will become the permanent property of the United States.

In the third major event of the Detroit Air-Olympics more than 500 boys, winners in sectional contests now being held over the country, are expected to compete for the Stout Indoor Trophy and the Mulvihill Outdoor Trophy, in the Boys National Model Airplane Contest. Griffith Ogden Ellis, publisher of *American Boy Magazine*, in charge of the contest for the committee, has arranged a two-day tournament, with the finals scheduled for early afternoon on the day of the Air-Olympics. The winner of the model plane contest will be sent to London to represent the United States in the International Model Plane Contest to be held there.

Another highly interesting feature of the Air-Olympics will be a demonstration of gliding by Harry Karchner, member of the American Gliding Team that visited Europe in 1922, and Andrew Althouse of the Cass Technical High School faculty.

Charles T. Kettering, vice president of the General Motors Research Corp., and chairman of the sub-committee in charge of reception, recently announced that Mayor John C. Lodge of Detroit has extended invitations to all members of the diplomatic corps in Washington, inviting them to attend the Air Olympics. Special entertainment will be provided for the American government officials and representatives of foreign nations, Mr. Kettering said.

Reducing the Cost of Fire Insurance

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not be much of an inconvenience, the difference in the fire insurance costs probably more than offsetting the additional cost of plane construction.

The paint room will be equipped with a forced ventilation system capable of changing the air at least every three minutes, and the room will be heated from an outside source; that is, a furnace will be installed just outside of the dope room and separated from it by a 12 in. brick wall. Hot air will be forced through pipes from the furnace into the dope room and distributed over the entire area. Only fresh air from the outside will be forced into the room, for, in connection with the heating system, a large fan draws cold air from the outside, through the heating system and thence into the dope room.

The electric light bulbs are equipped with vapor proof globes while all motors are to be of the totally enclosed type and elevated 4½ ft. from the floor.

Storage of dope in the paint room is limited to a one day supply and it is to be kept in metal cabinets.

There was some question relative to the thickness of wall construction—eight or 12 in.—and it was found that the difference in the insurance rates was not sufficient to compensate for the higher construction costs.

Another feature which will serve to reduce the fire hazard is an incinerator for saw-dust, shavings and other rubbish. It will be located at a distance from the wood working building and chutes will carry the rubbish to the furnace where forced draft will rush the burning process. Natural gas for heating will be used thus precluding the saving which might be made by using the rubbish for heating purposes.

The old factory building, which is being remodeled, is 120 ft. long and 80 ft. wide. The paint and woodworking departments will be in a building directly west of the old one and will be 50 ft. wide and 120 ft. long, setting parallel with the old one. The administration building is another new and separate structure, 30 ft. wide and 66 ft. long. It stands south of the old building and sets back from the highway at sufficient distance to permit landscape gardening. The offices will be in the front of this building and the drafting room in the rear with sufficient space for experimental work. There is room in the drafting room to set up a complete plane.

The old building, when remodelled will contain four de-

partments—fuselage construction and welding, fuselage assembly, sheet metal work, and final assembly.

The Swallow Company is the oldest commercial airplane manufacturing concern in the United States. It has gone through the trials and vicissitudes of pioneering companies. Those troubles are in the past, now, and the future looks rosy. Under present program and with the facilities offered by the more ample quarters, the 1928 production is stated to be 12 planes a week.

The Stinson "Junior"

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push rods work in graphite bearings mounted behind the rear spar.

The Warner Scarab engine, developing 110 hp. at 1850 r.p.m., is mounted on a welded steel tubular truss bolted to the fuselage frame. The engine is fitted with a Hamilton wooden propeller. Standard equipment includes exhaust ring, cabin, and carburetor heaters. The normal fuel capacity is 45 gal., which should permit a range of approximately 600 mi. Gasoline is carried in two wing tanks, mounted between the wing spars in the inner drag on each side of the fuselage. The tanks are supported by steel straps bolted to the spars and partly by the drag wire bracing. The supports are covered with felt to prevent rubbing against the tank. In addition to the wing tanks, there is a one gallon auxiliary tank mounted on the firewall. Two front lines from the wing tanks are connected to the top of this auxiliary tank and two rear lines run down the rear and are connected to the bottom of the auxiliary tank. In this manner air in gas is eliminated and the one gallon tank will care for needs of the engine during any manouver. A strainer is employed between the auxiliary tank and the carburetor. The oil tank is under the engine cowling in front of the wind shield. It is filled from the cabin on the right side.

The SM 2 was designed according to the Department of Commerce Specifications, with a factor of 6½ for high incidence and 4½ for low incidence. The landing chassis and tail wheel were designed for a load of 6½ tons.

The manufacturer's specifications are as follows:

Length overall	26 ft
Height overall	7 ft. 9 in
Airfoil	Clark Y
Span	41 ft 6 in.
Chord	6 ft 3 in.
Total wing area	236 sq ft.
Ailerons area	21 a sq ft.
Horizontal stabilizer area	19 3 sq ft
Elevator area	17 sq ft
Fin area	5 2 sq ft.
Rudder area	10 5 sq ft.
Weight empty	1428 lb.
Pay load	350 lb.
Disposable load	825 lb
Gross weight loaded	2253 lb
Design, gross load	2500 lb.
Power plant	Warner 110 hp at 1850 r.p.m.
Wing loading	9 54 lb./sq ft.
Power loading	20 48 lb hp

Estimated performance:

High speed (full load, sea level and in level flight)	110 m.p.h.
Cruising speed	95 m.p.h.
Landing speed	46 m.p.h.
Gasoline consumption at cruising speed	6.5 gal. per hr
Gasoline capacity (normal)	45 gal.
Range at cruising speed	600 mi.
Endurance at cruising speed	6 0 hr

The Szekely Engine

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is free to turn both in the piston and in the connecting rod bearing.

The cam arrangement is interesting and, while novel, has been used in other services for a number of years by the Szekely organization, so that nothing untried is being used in this respect. There is but one cam to operate both the intake and exhaust valves on each cylinder. This cam is driven from a spur gear on the crankshaft and operates the valve through the means of a hardened and ground cam follower, which is bronze bushed and located by means of a hardened and ground pin fastened to the crankcase.

The ignition system consists of two Robert Bosch magnetos mounted on a shelf which is an integral part of the rear cover and driven from the engine by means of spur gears.

The O. E. Szekely electric test equipment for aircraft engines

Each magneto fires a spark plug on each of the three cylinders, so that the engine is provided with two independent ignition sources.

The carbureter is suspended below the engine and connected to the crankcase by a Venturi type manifold. It is the Zenith 1½ in. balanced airplane type.

The weight of the engine, with all accessories, is guaranteed by the manufacturer not to exceed 153 lb. The average production engine weighs approximately 148 lb. Tests have demonstrated that this engine is ideal for a single or two place plane having from 25 to 30 ft. wing span and weighing between 475 and 525 lb. As installed in such a plane, the engine turns a 40 hp. propeller at 1725 r.p.m. on the ground and better than 1850 in the air, in this way giving an ideal cruising speed of from 80 to 85 m.p.h., at an engine speed of from 1550 to 1600 r.p.m. Flight tests show that the fuel consumption, under average conditions, is approximately 58 lb. per hp./hr., with an oil consumption guaranteed not to exceed 029 lb. per hp./hr.

As this article is being written, the Department of Commerce is sending an observer to the plant of the corporation to witness necessary tests so as to give it their approval for airworthiness. This will permit the engine to be used in licensed aircraft. The fact that the Department found the test equipment of the O. E. Szekely Corp. complete and up to date so that a test could be conducted in Holland, Mich., the same as would otherwise be run at the Bureau of Standards in Washington, speaks well for the care and knowledge the manufacturer used in the development of this aircraft engine.

SIDE SLIPS

By ROBERT R. OSBORN

A news item concerning the flight of Army amphibian planes to the rescue of the stranded Bremen, stated that the rescue pilot might have to be dropped with a parachute, and that after inspection from the air "General Fechet will decide whether melting ice and mud make a landing in even an amphibian plane too dangerous."

If the situation looks doubtful, the safest procedure would seem to be an eight point landing on the wheels, tail skid, a pair of skis, the pontoon and wing tip floats.

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Mr H. W. W. of Winthrop, Mass., sends along a clipping from a prominent Boston paper of an article about a number of women aviators. According to the item, one lady pilot has had "three forced flights without the slightest mishap, to her credit."

Of course the expression "forced flight" does sound funny at first, but when you stop to analyze it a large proportion of the flights are forced. You know that feeling, "Gosh I don't feel like flying today but I don't feel much like starving either."

• • • •

Captain Wilkins and Carl Eielson may not have discovered any land or navigational routes on their recent flight across the Arctic regions, but they have at least furnished a possible clue to the whereabouts of the mysterious Swiss navy. According to a Minneapolis clipping from H. F. C., their great flight was from Point Barrow, Alaska, to Green Harbor, Switzerland.

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For reasons which may be obvious upon reading it, the editor has transferred the following bit of news from a Spanish correspondent to this column, from the usual place under "Foreign News."

Thursday of last week the town of Preston was astonished by the roar of the engine of a monoplane. The white pidgeon plowed the air and with giddy rapidity circled the town of batey of this central. Moments later it landed in the grounds of the polo. Upon their descent the aviators were given an immense ovation by the people gathered there.

Right away the amiable "clubman" R. B. Perry in his elegant machine conducted them to the telegraph office where they sent various dispatches. Later the intrepid aviators were lodged in the Hotel Preston. By friend Perry I was presented to them and in a rapid interview I could note the following: Captain C. B. D. Collyer is a special pilot of the Pan-American Airways who brought the plane from Havana and here handed it over to Victor Dallin special pilot to fly the ship while the work lasts. R. A. Smith, pilot and photographer who takes the photographs and who is chief of the photographers of the Fairchild Aerial Survey. The machine is a monoplane, number 3890 constructed by the Fairchild Aircraft Co. of a special type to take pictures in the air. They are now making an aerial survey for the Cuba Co. and the United Fruit Co.

The aviators are all famous, having experience since the great world war and are all members of the Association of Quiet Birds, an international social club which has as members the most famous aviators who have arrived in the United States as Lindberg, Chamberlain, Laborde, Bird, Acosta and others.

FOREIGN NEWS

By Special Arrangement with the Transportation Division Bureau of Foreign and Domestic Commerce

R.A.F. on Annual Distance Flight

The British Royal Air Force is completing its annual long distance flight from Cairo to Cape Town and back. The planes used are four Fairey III F biplanes powered with Napier Lion engines. These planes are a military observation type fitted for day bombing, fighting, reconnaissance, photography, etc. It is designed to use either wheel or twin pon-

The Fairy III.F biplane used by the British Royal Air Force. The craft is powered with a Napier Lion engine

toon undercarriage. Although this is a comparatively new type for the British Royal Air Force, many squadrons are now using them. It is stated that they have a high performance and are very maneuverable.

Poland Has New Air Traffic Rules

By recent government ruling, new air traffic regulations become effective this month in Poland. By the provisions of the decree aviation over Polish territoey is permitted to flying machines registered in Poland and to Polish military planes and airships. Foreign-owned planes and airships are permitted to operate over Polish territory on the basis of international agreements or under special permit from the Polish authorities.

The Ministry of Communications is charged with the supervision of private and commercial aviation, and the Ministry of War with military aviation. Pilots and crews of all Polish flying machines must be of Polish nationality and be not less than 21 yr. of age in the case of pilots of passenger carrying planes or 19 in the case of other pilots.

Landing fields may be established and maintained only under permission from the Ministry of Communications, and flying machines must be inspected by the designated authorities before each flight. Ownership of foreign flying machines, and all legal acts performed thereon, are subject to regulation by the laws of the country in which they are registered.

This decree, furthermore, includes regulations pertaining to passport and customs formalities.

Long French Flights Need Government O.K.

Airplane flights over great distances cannot be attempted from France in the future without careful investigation and endorsement by the government, according to a recent decision of the Council of Ministers of France. The new ruling, however, is not expected to affect pilots who were preparing for trans-Atlantic flights as the new decree was made.

AIRPORTS AND AIRWAYS

Boise, Idaho
By Robert Blackstone

Boise's airminded recently had a treat in the arrival of C. W. "Speed" Holman, world's record holder for looping the loop, and winner of the New York-Spokane air derby last year, when he set down here with John P. Grier, New York clubman and banker, whom he is piloting across the continent.

Holman said he flew straight over the Grand Tetons, at the south of Yellowstone Park, to Rexburg, Idaho. From there his flight was across country to Fairfield, on the Big Camas, flying from there west until he picked up the Boise River, then followed it into Boise. This route is far removed from the regular airway into and through Idaho, but is scenic, as it crosses the Sawtooth Mountains—the American Alps. In Wyoming besides the Tetons they also crossed the Wind River Range. Their coldest weather and their hardest climb on the trip was over these, according to Mr. Grier. He also said they flew an air line from St. Paul to Boise.

The airplane Holman is using is the same in which he made his 1433 consecutive loops in establishing a new world's record.

The same day but prior to the arrival of Holman, "Jack" Storey, piloting a plane from Denver to Tacoma for the Olympia Air Transport Co., which operates service planes in the Puget Sound country, landed at the local field to refuel. When told that "Speed" Holman was due to arrive, he decided to "stick around" and help greet a fellow birdman.

"Hap" Roundtree, operating a commercial plane off the Boise flying field, is doing an excellent business of sightseeing trips over Boise as well as short flights to nearby towns.

Again the Caldwell Airport has been used by a Varney Air Line mail plane pilot. Storms to the east had held up the mail, but by flying through to Caldwell, the mail train was overhauled and the pouches put aboard thereby keeping the schedule.

Cyril C. Thompson, Idaho governor of the N.A.A., announces that the first "aero portah" will arrive in Boise during the coming July, when the national air tour planes visit Idaho's capital city. Benny Smith claims to be the first air porter in the United States. He will be in charge of passengers' welfare on the all-metal airplane put in service recently by the Halpin Development Co. of Cincinnati.

Orlando, Fla.
By R. T. Bly

The Orlando chapter of the N.A.A. held its first meeting in May at the San Juan Hotel under the direction of its president, William Justice Lee. Mrs. Ulysses Grant McQueen, outstanding woman air enthusiast of this section, spoke on the advantages of the N.A.A. membership and E. C. Nilson outlined plans for an airplane show.

This show was held later in the show rooms of the Ward-Leonard Co., Nash automobile dealers. A new Waco 10 was the principal exhibit. Fifteen or 20 model airplanes by Marchand, showing types of land planes and seaplanes, were exhibited. Enlargements of aerial photographs of Orlando by the Nilson-Roach Co. were also shown.

Show cards attached to the plane exhibited pointed out the special features such as drop center wheel rims, Hartzell propeller, tail skid, etc. Prices with different power plants, cost of extras, etc., were also given.

Young Stribling, Georgia boxer and Swallow plane agent, made a trip in his Swallow to attend the show. Several interesting talks were made by Orlando's war time fliers, Clay Binion, George Patterson, Stuart Davies, and Ted Landerf.

During the show two Waco 10's were sold and delivered. L. T. Herrick of Kissimmee and Fred Briles of Leesburg, Fla., were the purchasers. The Nilson-Mueller Co., distributor of Waco planes for the state, sponsored the show.

James Johnson, chief pilot of Orlando Airlines, Inc., has moved to Dearborn, Mich., where he is now in the employ of the Stout Air Service, Inc.

Salt Lake City, Utah
By E. E. Hale

Along about June 15 the National Parks Airways, Inc., will have four Fokker six passenger Super Universals in the new hangar now almost completed. These planes go on the Salt Lake-Great Falls air mail line.

The Boeing Air Transport, Inc., operating the transcontinental air mail line, will make Salt Lake headquarters for the four tri-engined 12 passenger planes now nearing completion at the company's Seattle plant. They are Wasp powered. The Boeing company now has four Hornet powered planes operating between Salt Lake and Cheyenne on the regular mail schedule.

At the end of June, Salt Lake's airport will be housing 50 planes, including the Army planes used by the 329th Squadron in command of Lieut. Russell L. Maughan, dawn to dusk flier.

The Varney Air Mail Co., operating the Seattle to Salt Lake route, is awaiting improved field conditions at Boise for putting on passenger carrying planes. Swallows and two Stearmans are now in use.

The Salt Lake City commission has a force of men at work on the field installing a complete drainage system and will begin putting up new boundary lights as well as stringing red lights on all field obstacles. Landing lights are to be increased. It is the plan now to have the Salt Lake field fully equipped as a regular night landing field before the government changes schedule, making this a night port.

Springfield, Mass.
By Charles Hanson Gale

This city was treated to one of its greatest surprises recently when it was announced that Congressman Henry L. Bowles had secured options on a tract of land in Agawam, west of Springfield, and had taken steps to develop it into a triple-A airport. The announcement came as the climax of months of secret work securing the options on the land and obtaining expert advice on its suitability.

The tract is old tobacco land and is level for the most part. The surface is slightly rough in areas from plowing in recent years but this condition is said to present no problem. The soil is sandy, making perfect natural drainage. Flying operations could start at once with the removal of some of the tobacco sheds.

The tract is said to include about 311 acres. It is located about six miles from the city hall. Good roads most of the way enable an automobile to reach the field in about 15 or 20 min. The sponsors of the project state that it will be a $275,000 airport and this is understood to include extensive work on the field, hangar construction, lighting and other developments.

Representative Bowles' determination to have the field capable of being developed to a triple-A airport has resulted in bringing here several government and private experts on airport construction before the decision was made, it is said.

No obstructions are present and there are available lighting, water, telephone, and railroad siding facilities. It is expected that when fully developed the tract will be one of the finest airports in the east. There is considerable room outside the land so far secured by options for future enlargement of the airport.

Massachusetts Airways of this city recently signed a contract with the Westfield and Holyoke Chambers of Commerce for the operation of the Barnes Airport in Westfield which is being developed jointly by the two cities. The local company will have charge of the flying activities at the field but will not have exclusive flying privileges. The field will be an "open" port for all pilots. The company will represent on the field the Eaglerock and Ryan planes for which it is the New England distributor. The contract became effective recently.

G. E. Crosby, chief engineer of the American Airports Corp., which is developing the Fisk Park Airport for the Springfield Airport Corp., made an inspection recently of the work already done. Two steamshovels and a stump pulling machine are being used to rush the work to completion. Mr. Crosby pointed out that it is unusual to find a field of its size so close to the center of the city.

Camden, N. J.

For use at Bader Field, Atlantic City's Municipal Airport, the Crescent Air Service, Inc., of this city has purchased a 52 by 80 ft. Esline All-Steel hangar from the Esline Company, 610 Michigan St., Milwaukee. The hangar has been shipped and will be erected at the shore immediately upon its arrival.

The Crescent company has been operating several of its three place Challengers (OX-5) at Bader Field, with excellent patronage. Jack Arthur, who recently joined the company and was sent to the shore to replace Al Graham, Chief pilot who resigned, has reported an increasing public interest at the airport.

The company has signed up a number of members of the Aero Club of Atlantic City for flying instruction at Bader Field. A class of women aviation students also is being organized.

Al Graham has joined the Keystone Flying Corp. and has reported at the company's field, Roosevelt Boulevard and Red Lion Road, Philadelphia. Warren Hallowell, another former Crescent pilot, has signed up with Veale Aviation, Inc., at Hazleton, Penna., and has reported for work at the company's field at St. John's.

Students of the Crescent Air Service, Inc., with headquarters in the Fox Building, Philadelphia, and operations at the Crescent Airport, Camden, and Bader Field, Atlantic City, include the following:

Crescent Students

J. Hobart Condit, 110 Linden St., Camden; Arthur Lynah, 416 S. 41st St., Philadelphia; Harry W. Denslan, 2255 N. 16th St., Philadelphia; Harry H. Hagmaier, 2306 Sepviva St., Philadelphia; Millard P. Scally, 2526 Spevive St., Philadelphia; Charles W. Truckcess, 206 S. 36th St., Camden; Joseph F. Bannan, 619 Clifton Ave., Collingswood, N. J.; John Patoto, 1514 S. 15th St., Philadelphia; John Gallagher, 49th and Florence Ave., Philadelphia; Douglass G. Heist, Care Y.M.C.A., West Philadelphia; Frederick Riedel, Jr., 4 Pacific Ave., Collingswood, N. J.; Allan Ricks, 453 Pine St., Camden; James McGarrigle, Care Philadelphia Inquirer, Philadelphia; Lillian Riedel, 4 Pacific Ave., Collingswood; Robert Brown, 615 Chester Ave., Moorestown; Charles Ahle, 16 Marne Place, Ocean City; Larry Kelly, 124 Ormond Ave., Collingswood; Willie Ober, 6522 Beaumont Ave., Philadelphia; F. S. Rowland, 116 N. 60th St., Philadelphia; Nicholas A. Engelman, 1110 N. Bodine St., Philadelphia; J. V. Neatham-

mer, 461 N 45th St, Camden, R J Schmidt, 219 Virginia Ave., Collingswood, and Frank Vondenbruck, 6104 Nassau Road, Philadelphia.

Succeeding Harry Krechmer, Philadelphia business man, John Brunton, Atlantic City business man, has been elected president of the Aero Club of Atlantic City William G Williams has been elected vice president. The club's headquarters are at 1214 Atlantic Ave, Atlantic City, and visiting pilots are welcome

During the club's last two meetings, 26 new members have been admitted

Newton, Kan.
By Creighton Merrill

Newton can well boast of having as good airport facilities as any town of its size in Kansas. Newton's population is 10,000 people, and it is situated only 25 mi. north of Wichita, termed "The Air Capital"

Early last year the Chamber of Commerce leased a 75 acre tract of meadowland and converted it into an airport. The ground is for the most part level, well drained, and is just off the main street of the town only a mile from the business district. A hedge which bordered the field has been removed There are three railroads entering Newton, one of which borders the field, making it easy to find. There is also a large white gravel circle showing the center and the best part of the field on which to land. A regulation wind indicator also helps pilots in landing and taking off

The airport was given a fine dedication last year when there were nearly a score of planes on the field including five Army craft. Lieut Ennis C Whitehead, Army flier with the South American good will flight, and Eleanor Ambrose, dancer, assisted in the dedication, going aloft and dropping flowers on the field. Both claim Newton as their home

The field has been used considerably by overnight visitors and barn stormers. The All-Kansas Air Tour, consisting of 25 planes, including the Ford-Stout monoplane Stanolind and an Army Hawk flown by Lieutenant Whitehead, recently made this airport its first stop The people showed an unusual interest in the tour, turning out to the number of 5,000 and plied the tour party with questions Gov Ben S Paulen, who has shown great interest in aviation in Kansas, accompanied the tour in the Stanolind and made a short speech at each of the more than 30 cities visited

"Bud" Nellans, a local boy, has bought a clipped wing Canuck, the first Newton-owned airplane He had taken only four hours of instruction when he bought the plane, yet he took off from the Wichita Airport in a 30 mi wind and brought it safely to its new home port.

Philadelphia, Penna.

The Aero Club of Philadelphia has applied to the state for a charter of incorporation. The club, devoting itself to the aviation training of young men in moderate circumstances, has announced plans for a city-wide expansion of its activities. Squadrons are being organized in Germantown, North and South and West Philadelphia, all of which will be linked with the present organization for the purchase of planes and the securing of other facilities.

D. G. Hendrickson has resigned as president and his successor will be elected at the club's next meeting The club has started operations at Michels Field, above Hallowell, Penna. Downtown headquarters have been established in Room 1013, North American Building Meetings are held each Thursday night in the Exchange Building, Fifth St and Lehigh Ave.

Other club officials include Rudolph Moosbrugger, 118 Latimore Ave., vice president, J C O'Brien, 2130 South Mole St., financial secretary; William J Michels, 882 North 23rd St, corresponding secretary, and E M Doherty, 1738 South

58th St., treasurer Lieut S A Latbom, 5816 Christian St, formerly of the 148th Aero Squadron and a World War pilot, is chief instructor, Anthony Valerio of Bringhurst is captain of the First Squadron, George Jackson, 2328 Mercer St, is captain of the Second Squadron, Robert G. Grubb of Willow Grove is parachute instructor, and Dr Charles Blanchard, Philadelphia, is club physician A Heath Parasol plane has been purchased by four members of the club It is being assembled.

Robert Critz of Winston Salem, N C., has accepted delivery of the first Sport Mailwing to be sold by Pitcairn Aviation, Inc., with headquarters in the Land Title Building, this city. The plane was completed this month at the company's factory at Bryn Athyn, Penna.

The Philadelphia Airport, leased and operated by the Ludington Philadelphia Flying Service, has announced the following recent visitors: C S "Casey" Jones, piloting his clipped-wing Oriole (Curtiss C-6) on a flight from New York to Washington, Henry Noll of Pleasant Gap, Penna., piloting a Waco 9 here; Pilot Basham flying a Swallow here from Wichita, Kan , Archer Saki of Lakewood, N J, operator of the Archer Flying Service of Lakehurst, piloting a Waco 10

Robert P Hewitt, manager of field operations at the airport, has returned to Philadelphia after taking news reel photos by plane to Washington and other southern points. He flew a Fairchild cabin monoplane.

Charles Townsend Ludington, president of the Ludington Philadelphia Flying Service, has purchased a new Fairchild cabin monoplane (Wright Whirlwind) for service at the airport. The company's first Fairchild was purchased last fall and has been in almost daily service since its arrival here. Both planes are being kept busy.

Oil City, Penna.

Oil City's new municipal airport was recently dedicated, the local chamber of commerce sponsoring the affair and arranging for a city-wide holiday. A banquet was held on the night of the dedication honoring visiting pilots and notables. The Derrick Publishing Co. issued a special aviation number of the *Oil City Derrick* with illustrations of airplanes and equipment

Oklahoma City, Okla.
By Ernest W. Fair

More than 250 students of Central High School here received their first airplane ride recently at the Burrell Tibbs Flying School. It was the first ride for most of the students. The ride was sponsored by the Aviation Club of Central. Eaglerocks were used by Tibbs. C. W Gethmann, principal, and Rhoda McClintock, editor of the *Sooner Spirit*, school paper, made trial flights before it was decided that the students would go up

The Kenyon-Rey Floral Co is another local firm that soon plans to purchase a plane The company will use it in making the rounds of the different jobs throughout the state.

Aviators flying over Oklahoma City will find a guiding sign upon the top of the new Commerce-Exchange Building when it is completed An arrow will point to the Municipal Airport with letters large enough to be seen at a great height. At present the only marker on the top of a downtown building identifying the city is one on the Ford plant which aviators say cannot be seen at great heights.

Oklahoma City will choose a representative to attend the celebration of the tenth anniversary of the air mail service in the United States at Chicago, O. N Daley, chairman of the postal sub-committee of the Chamber of Commerce, has announced.

Bob Cantwell, with Mr and Mrs. Erle Halliburton of Duncan recently flew from that city in a Lockheed Vega plane

in 11 hr 30 min to Washington. This is an exceptional record, aviators here believe

Burrell Tibbs has about 15 pupils in his school here. He has graduated over 60 since starting three years ago

Duncan, Okla.

At a recent meeting of the city commissioners the newly acquired airport was officially named the Halliburton Field in honor of Erle P. Halliburton of this city who has been more instrumental than any other one man in the advancement of aeronautics in this section. Halliburton Field is now undergoing many improvements and in the near future descriptions and drawings will be submitted to the Department of Commerce for publication

C Hewitt, geologist for the Carter Oil Company, has moved to Duncan bringing with him his Travel Air for permanent location on Halliburton Field. Mr Hewitt recently soloed in Wichita and now uses his plane daily in connection with his geological work.

Bob Cantwell, formerly with Southwest Airways Corp of Oklahoma City, has moved to Duncan and is associated with the Halliburton interests as pilot of the Lockheed Vega monoplane

The Duncan Air Service has under construction a new 60 x 80 hangar to house the Eaglerock Sales and Service in this district of the State Hangar space and service is available to transient and local pilots. The Duncan Air Service is a partnership composed of John C Halliburton and R W Cantwell who are installing all new equipment for cross-country service, a 10 hr instruction course and general aerial service

Bob Raines has moved his Hisso Standard from Love Field Dallas, to Halliburton Field for permanent headquarters

A new all steel hangar has been completed to house the Lockheed monoplane belonging to Erle P Halliburton

Kansas City, Mo.

By H H James

A Ryan monoplane equipped with Whirlwind engine has been on display at Washington Square near the Kansas City Union Station. It was placed there by C E. Fleming, divisional manager of the N A T., with a view of interesting citizens in aviation and air mail. The plane will shortly be entered in the N.A.T service.

Warmer days are bringing a big increase in air passenger and mail traffic on the N.A.T. lines, declares Fleming. Among recent passengers on the Kansas City-Chicago route, between which points the fare is now $45, were O. W. Ellis, Miss Catharine Agar, Wilson Jaicks, Mr and Mrs. W. I. Cooper Waddel E Smith, Noel V. Wood, H. W. Haraford, and W. G Backley.

Walter A. Nisun, president of the Ni-San Bus and Air Lanes, with C C Madison, former United States district attorney for Western Missouri, went by plane from Kansas City to St. Louis recently. They made stops at Jefferson City and Columbia, Mo. Fred Kane was the pilot. The plane used the new Parks Field, East St. Louis, in landing. This field is three miles from the St Louis post office and is described by Mr Nisun as being very accessible.

Garden City, L. I., N. Y.

By M. Brown

Kenneth Bunyard, Curtiss student, made his first solo flight after having had only five hours of instruction.

Additions to the Curtiss office force are Mr Myers and his wife. Mrs. Myers is private stenographer to M. M Merrill, manager of the Flying Service.

Bill Lester, formerly with Curtiss, has become affiliated with the Fairchild Aviation Corp. The Fairchild company is constructing a private landing field at Farmingdale, and as soon as it is finished, will vacate the hangar at Curtiss

Field. This hangar will probably be used by Curtiss for training planes.

William Winston and A. Caperton, each flying a Fairchild, took baseball enthusiasts to Montreal to a ball game a short time ago. William Winston was the Curtiss pilot who flew to Greenely Island, carrying a photographer, when the Bremen first landed. Winston took off for Greenely in a blinding snow storm, and flew part of the way with a broken aileron

Colorado, Tex.

Dewey Tidwell and G. A. Cole, officials of the Colorado Flying Club, and members of the Colorado Chamber of Commerce have completed plans for the removal of the Colorado Airport and all equipment to a much larger tract of land yet to be named. The new port will comprise such modern and up-to-date facilities as the following: An 80 or 90 acre field, regulation size circle with arrow pointing toward prevailing wind in center of field, flood lights, seven place steel structure hangar, gas and oil facilities for high test gas and the most popular lubricating oils, wind cone, radio receiving and sending set giving the daily weather forecast, bulletin board on hangar showing daily weather forecast, the words "Colorado Airport" in huge letters on hangar roof, expert pilot and mechanic on field day and night, two modern planes on field ever ready to transport passengers, and the very best of service otherwise. Visiting pilots will be furnished free transportation to and from town, and an automobile will be kept on the field for hire by the hour for those wishing to do their own driving

The Colorado Flying Club will continue giving flying instruction and doing commercial flying of all kinds, and chief instructor Grady A. Cole is now arranging the spring classes of students who have enrolled for flying. The new officers of the club are—president and secretary, Dewey D. Tidwell, vice president and treasurer, J. C. Fish; chief pilot and field manager, Grady A. Cole.

The aim of those interested in the removal of the airport is to make the Colorado Airport one of the best equipped and most modern airports in the U. S

Beaumont, Tex.

By Arthur E Nall

The municipal airport containing approximately 60 acres just west of Beaumont was formally opened on May 19 with a celebration under the auspices of the local post of the American Legion. The Legion was assisted in the ceremonies by members of the Beaumont Aero Club

Army planes from the training centers at Brooks and Kelly Fields and there from the Attack Group at Galveston and the 36th Observation Squadron of the Texas National Guard at Houston took part in maneuvers during the day. Invitations were sent to more than 3000 civilian pilots in the United States, and a large number attended. The opening was held just prior to the State Democratic Convention here on May 21

It is expected that plans for a second celebration to be held the latter part of June just prior to the National Democratic Convention in Houston will be announced by members of the Beaumont Aero Club at the opening of the airport. Plans are now being formulated for an air meet to be held here in connection with an annual regatta of the Beaumont Yacht Club. It would follow an air meet planned at Fort Worth

Owatonna, Minn.

The plans are rapidly developing for the early establishment of the airport, which is to be ready for use by the planes partaking in the Second Annual Wisconsin Commercial Good Will Tour. The planes are expected to arrive on June 14 from Minneapolis and will proceed to Rochester after a stop over here. The members of the airport committee are

John Lynard, C. A. Tincher, Mark Alexander, M. R. Cashman, and Mark D. Moore. This group is also trying to have their city designated as a direct point of exchange on the proposed air line to connect the Twin Cities and Des Moines, Ia.

Detroit, Mich.

By John T. Nevill

More than 125 artists were invited to enter a poster design contest being held by the Detroit Board of Commerce aircraft events committee by way of selecting an appropriate design for the Detroit Air-Olympics, a name recently chosen for the National Air Tour, the Gordon Bennett International Balloon Race, and the Boys National Model Airplane Contest, all of which are to be held here June 30

The contest closed May 23, with Ray Cooper, manager of aircraft events for the board, Karl S Betts, assistant manager, and John S Halliday, chairman of the contest committee, as judges. A prize of $100 was given the winner

George Haldeman, trans-Atlantic flier, now with the Stinson Aircraft Corp, and William A Mara, secretary of the corporation, were recent speakers before the Port Huron Lions Club Mara recently returned from Syracuse, where the Stinson company exhibited in the New York state aircraft show.

Stability as applied to aircraft was discussed recently by Prof. A Stalker, assistant in aeronautics at the University of Michigan, who spoke before the Detroit Flying Club

The Royal Oak Flying Club, whose roster includes 40 members, has secured 72 acres of land near Detroit to be used as the club's landing field. Sergt Thomas Carroll of the Royal Oak Police Department and member of the club, recently flew the club's first plane, a Waco 10, from Ypsilanti, where it was purchased from the Knapp Flying Service, Waco distributor for Michigan

Chicago, Ill.

By H. H Slawson

To enable the editor of the *Prairie Farmer* to cover his "beat" more readily, that magazine has added a three passenger airplane to its equipment It will be used in flying to fairs, farmers' picnics and meetings

Murray Ator, "the flying farmer" has been engaged as pilot *Prairie Farmer* was established in 1841 and is now in its 100th volume, having passed through four "generations" of transportation The first editor rode horseback Then came steam engines, the automobile, and now the airplane

Apollo Commandary, Knights Templar, of Chicago, plans to fly by airplane to the 37th triennial conclave of this Masonic order, which meets in Detroit in July. Officers, two companies and a band are scheduled for the flight.

Leonard Busby, president of the Chicago City Railways, recently took a flight by plane over the principal routes of the city's street car system, the better to grasp the "lay of the land", as he said Next time, he promised, he will take along some maps and a stenographer or two, in order to make permanent record of the data available on such a trip

Towner, N. D.

Jake's Airport here is seeing more activity with the spring warm weather The Leach Brothers are rebuilding an old Jennie, adding a pair of high lift wings they have purchased. Bill Leach has made a complete steel landing gear for the plane

Jerry Freeze recently dropped in with his Standard piloted by LaPorte of Maxbass The two are considering establishing a flying school at Towner.

Jake Bertram has commenced to build up his Hisso Standard. Bertram, who maintains the airport, extends invitations to all pilots who come to the vicinity to pay the field a visit. Two hangars are at the airport, and the runways are good.

Minot. N. D.

By Jake Bertram

Jacobsen Airport here is showing spring activity with four planes kept busy on a recent Sunday in passenger carrying work The planes are a Ryan monoplane, owned by the Westland Oil Co of Minot and piloted by Cecil Shoup, a Waco 10 owned by the Dakota Airway Co. and piloted by Chet Jacobsen a Canuck with Brandt at the controls, and Freeze's OX-5 Standard piloted by LaPorte

The Dakota Airway Co has opened a school and reports a number of students Minot will be a Ford Tour stop this year, and preparations for the event are already under way.

Mansfield, O.

Mansfield's new municipal airport was formally dedicated in a recent celebration The event was made a half-holiday throughout the city, businesses closing and schools letting out for the occasion

Seventeen planes were in attendance at the dedication They flew in from Cleveland, Columbus, Cincinnati, Dayton, and Akron The Goodyear company's blimp "Pilgrim" also arrived at the field Clarence Chamberlin, New York to Germany flier was the honored guest.

A special air circus and demonstration was put on by the fliers during the afternoon as a part of the ceremony

Superior, Wis.

The Superior Field, formerly known as the Arrowhead Airways Field, has been in poor condition due to the late spring, but some graveled runways will be provided, take off and landing difficulties will be mostly eliminated An OXX-6 Travel Air of the Roth-Downs Airways of St Paul and a Fairchild cabin monoplane owned by the Mid-Plane Sales & Transit Co of Minneapolis made a trip to this city with passengers

C M Peterson of Minneapolis replaced Ken Pettit, who is now with W E (Doc) Stickner as chief pilot, as the pilot for the Superior Airways Student instruction is given, passengers hopped and cross-country trips are made

Wausau, Wis.

By W. E Turner

At a recent meeting of the executive committee of Northern Airways, Inc, complete airport lighting facilities were ordered for Alexander Airport here. These include a 3,000,000 candlepower beacon With the new equipment installed, floodlights will be turned on for visiting pilots who notify the airport in advance of their coming. Announcement is also made that a concrete floor has been placed in the hangar and that rest room and lunch room facilities are being completed

Vancouver, Wash.

Municipal, county, or port ownership of the Vancouver, Wash, airport has been proposed by the local chamber of commerce The field is now under lease to the chamber from the Spokane, Portland & Seattle Railroad The field is generally used by commercial fliers who are not allowed to operate from Pearson Field, the Army airport.

Capt A I Engle has been assigned to Pearson Field here as commander succeeding Lieut. Oakley G Kelly who has been ordered to the Philippines. Captain Eagle came here from Crissy Field, San Francisco

Everett, Wash.

This community, under a handicap for some time because of proximity to Seattle, has grown to be a highly airminded city, according to "Tex" Rankin, who recently visited the Everett Airport. Everett's field is up-to-date, with $10,000 invested in hangars and equipment. Forty-two students are enrolled in a school taught by John Scott.

U. S. Air Forces

Navy Plans Dirigible Airplane Carriers

Plans are now under way by the Bureau of Aeronautics, Navy Department, to make a series of experiments testing the practicability of equipping dirigibles as airplane carriers, Rear Adm. W. A. Moffett, chief of the Bureau, announces. Similar experiments, the Admiral declares, have been made by European countries. The Navy tests, however, are to be made on a large scale covering several months time.

An arrangement would be developed, it is said, whereby planes would synchronize their speed with that of the dirigible, following which the planes would be "hooked" and drawn up beneath the airship. It is pointed out that the value of lighter-than-air craft in war times would be greatly enhanced by such an addition of auxiliary air forces.

Major Royce Succeeds Major Lanphier

Maj. Ralph Royce, U. S. Army Air Corps, has been assigned to succeed Maj. Thomas G. Lanphier as flight commander of the First Pursuit Group, Selfridge Field, Lieut. Col. Charles H. Danforth, commander of the post recently announced.

Major Royce is said to be the first American Army aviator to fly over the German lines during the World war. He is a Michigan man and graduated from West Point with Major Lanphier in 1912. The new flight commander has been commanding officer of Brooks Field, Tex., and now is attached to the Air Corps Technical School at Ft. Leavenworth, Kan. He will assume his duties here some time in August, Colonel Danforth states.

Second Neon Beacon for Mitchel Field

A second neon electric light aviation beacon will be erected at Mitchel Field, New York, the War Department having given approval to the recommendation of the Chief of the Air Corps for the installation. One of these beacons was installed by the Rainbow Light, Inc., of Long Island City, N. Y., for service test in August of last year in order to render every possible assistance to the several trans-Atlantic flights then planned by the British, French, and German fliers. The commanding officer of Mitchel Field reported the test successful.

Senate Offers New Promotion Plan

In a recent executive session, the Senate Committee on Military Affairs rejected the proposed plan for a separate promotion list for Army Air Corps officers and took action favoring a revised system whereby promotions would be expedited throughout the entire military service. According to the new method, promotions would be authorized on length of service, while additional facilities would be given for voluntary retirement.

Delayed Release Jumps Banned

Secretary of the Navy Wilbur recently issued a statement banning delayed release parachute jumps by naval personnel except on special authorization of the Department. The order follows a recent similar regulation banning outside loops.

U. S.-Canal Zone Route Studied

By a cross-country flight of two PW-9 planes from the Panama Canal Zone to the United States and return, the possibilities of an airway through Central America to the Canal are being studied by the War Department.

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